

FIG. 1

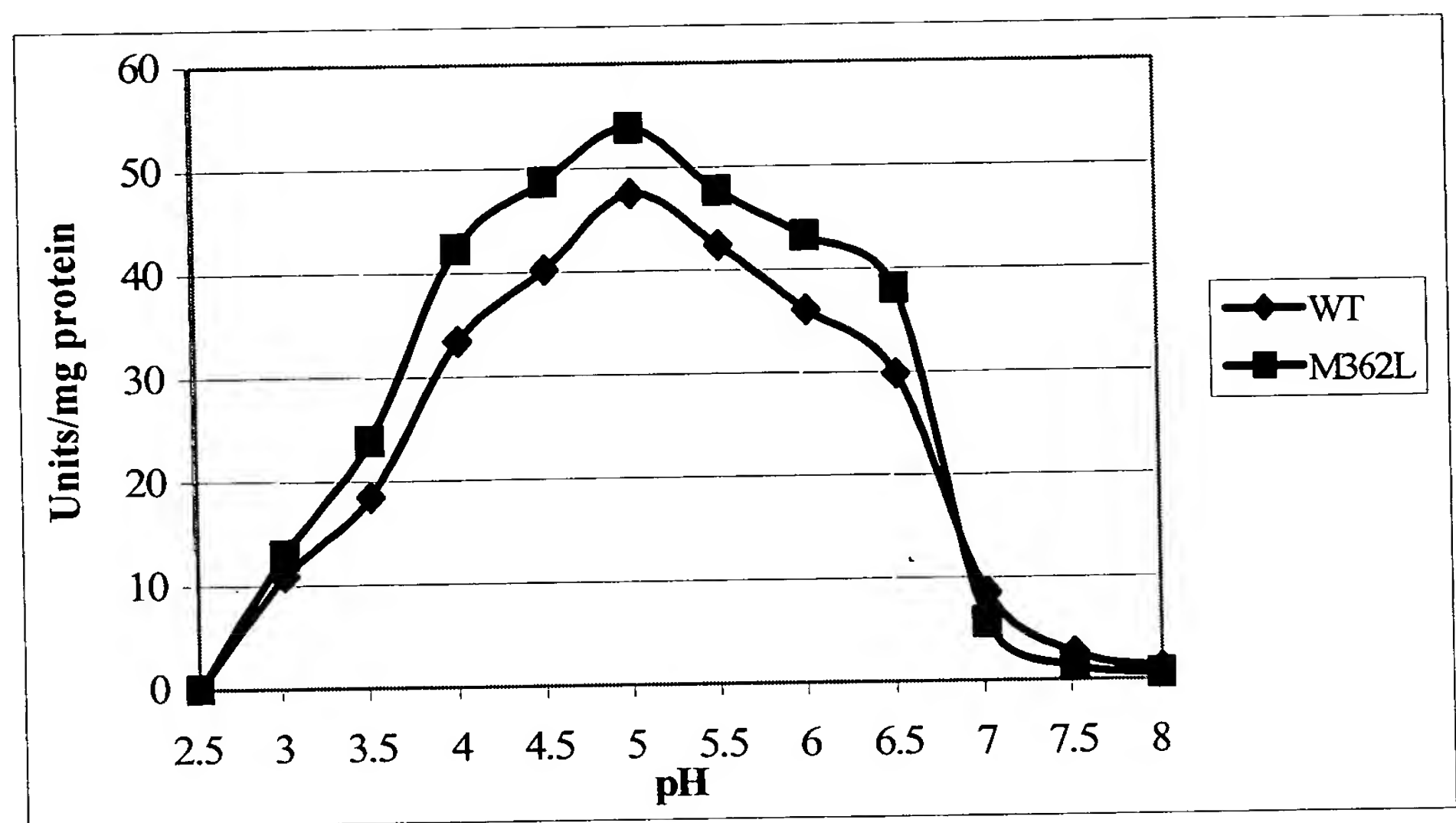


FIG. 2

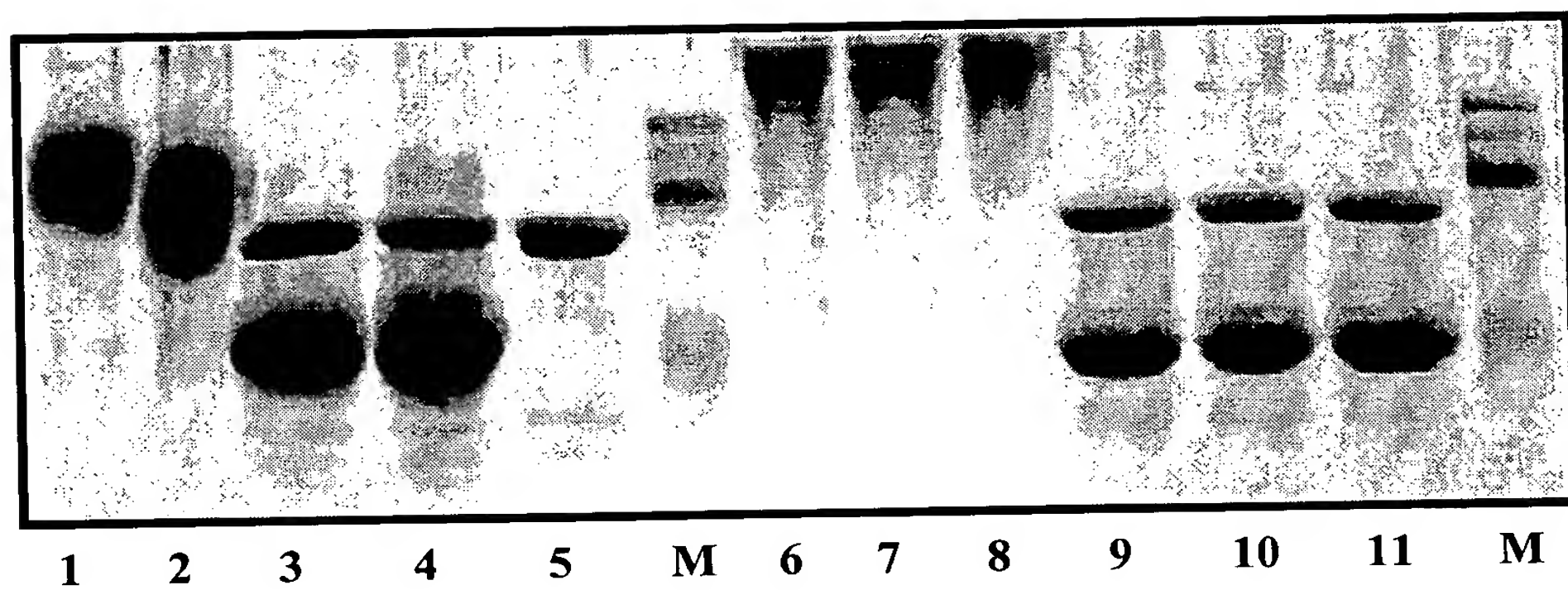


FIG. 3

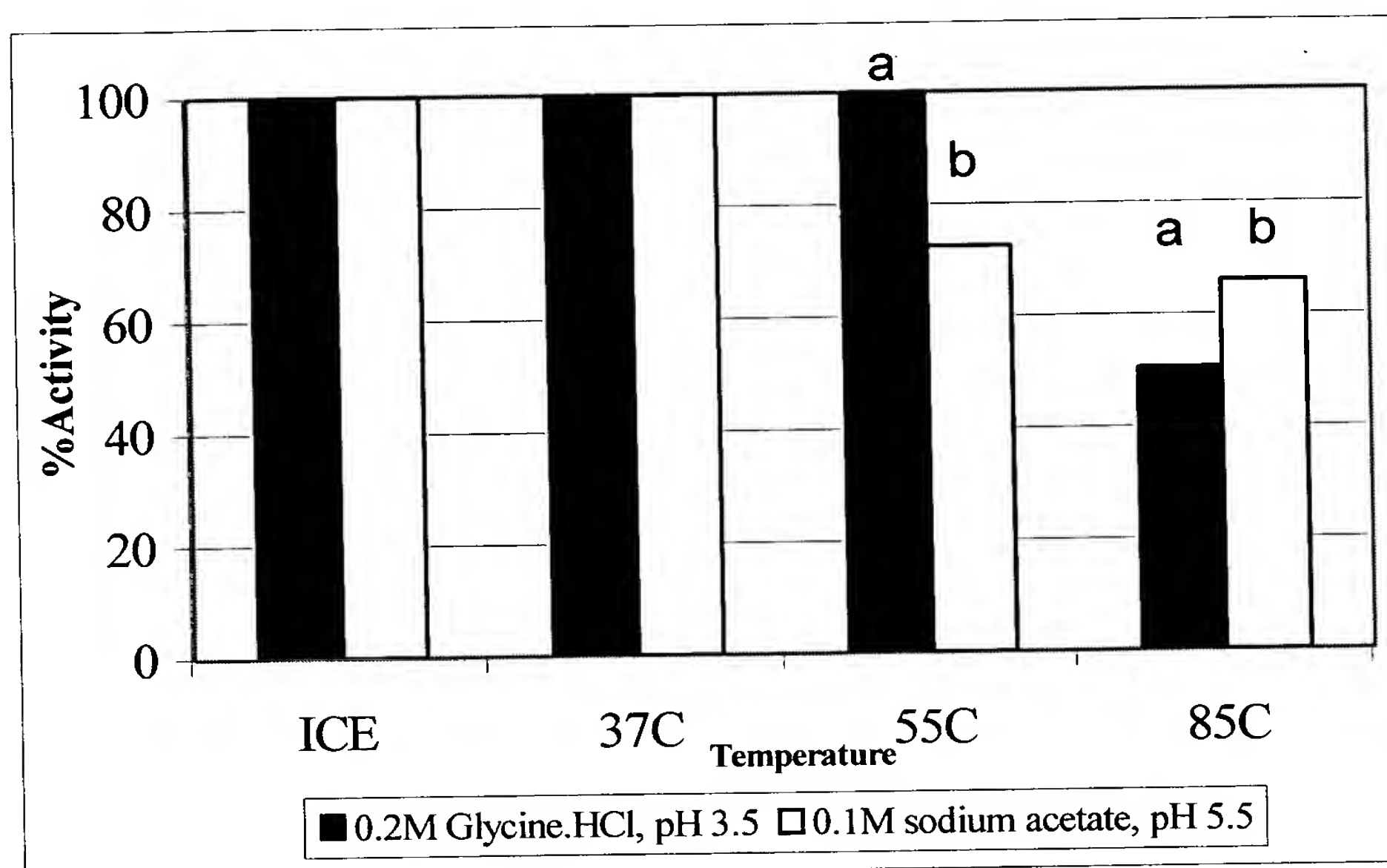


FIG. 4

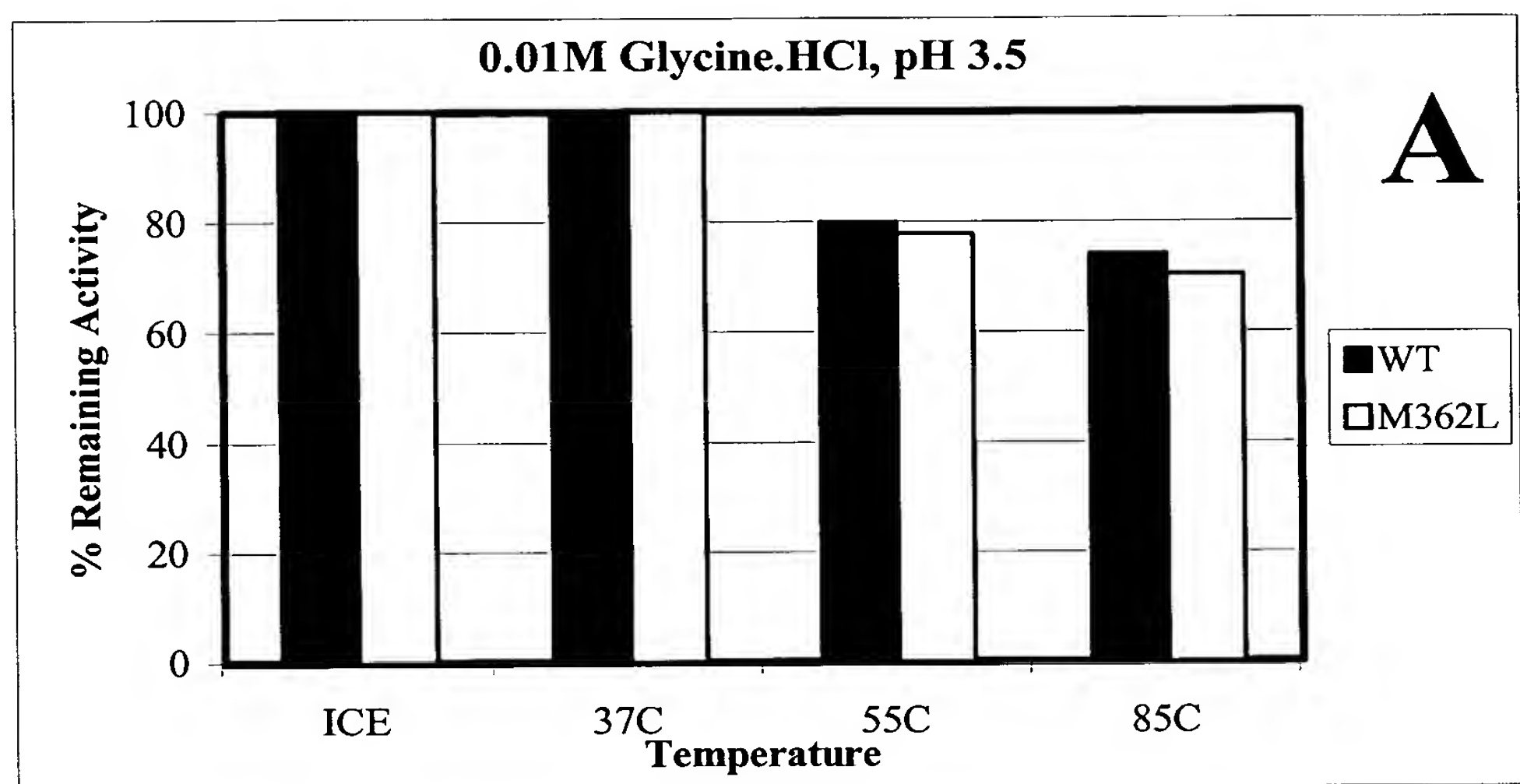


FIG. 5A

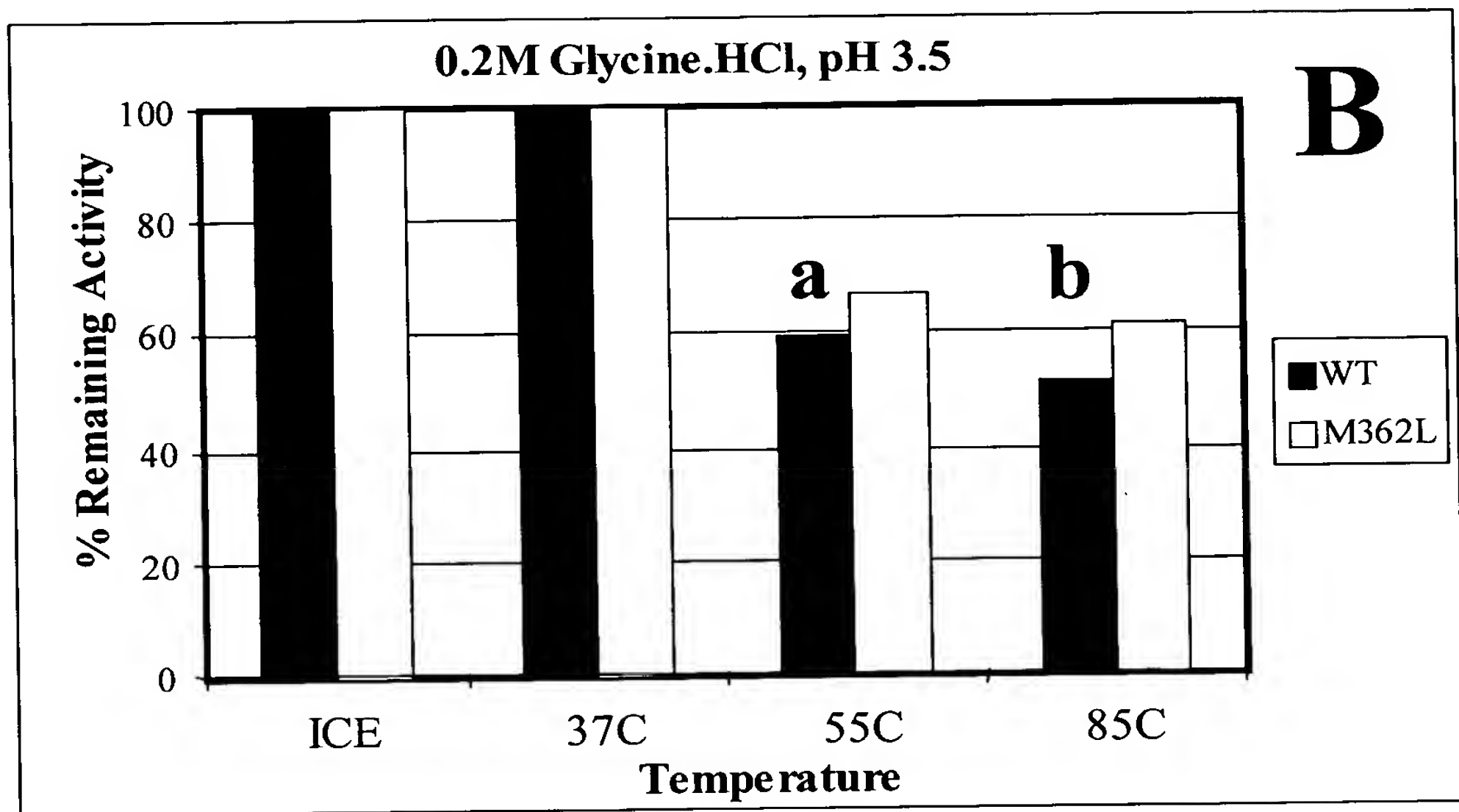


FIG. 5B

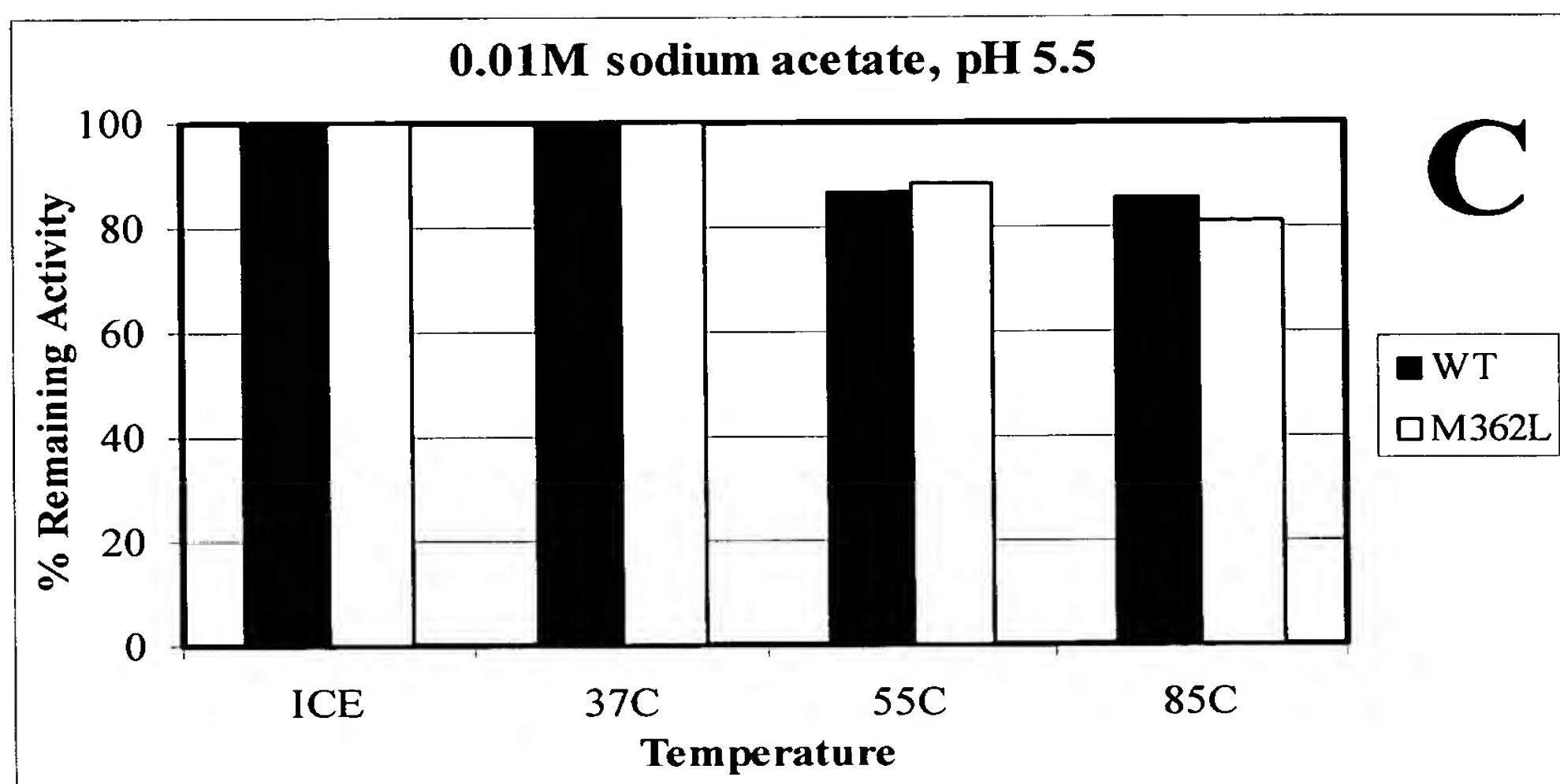


FIG. 5C

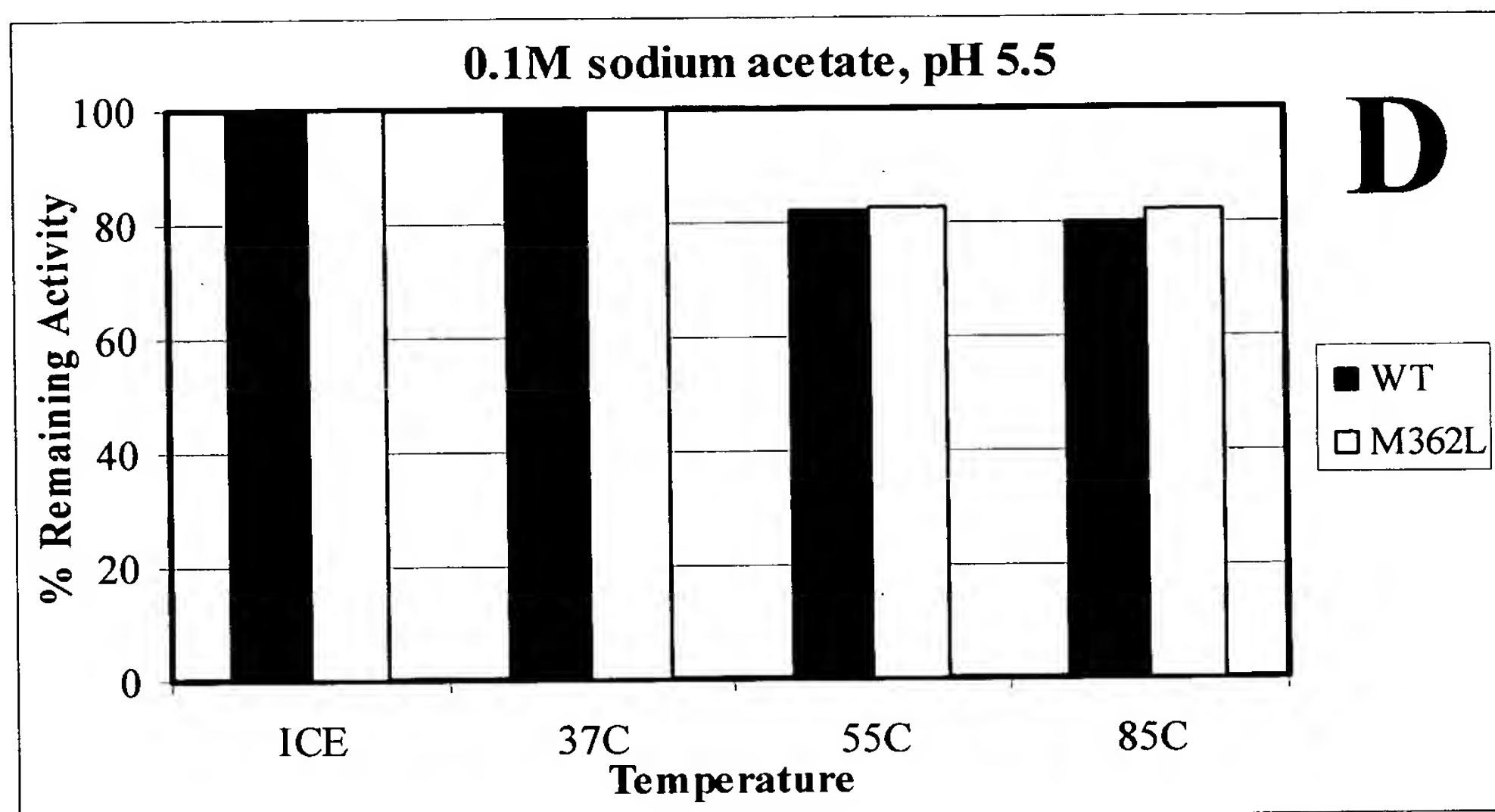


FIG. 5D

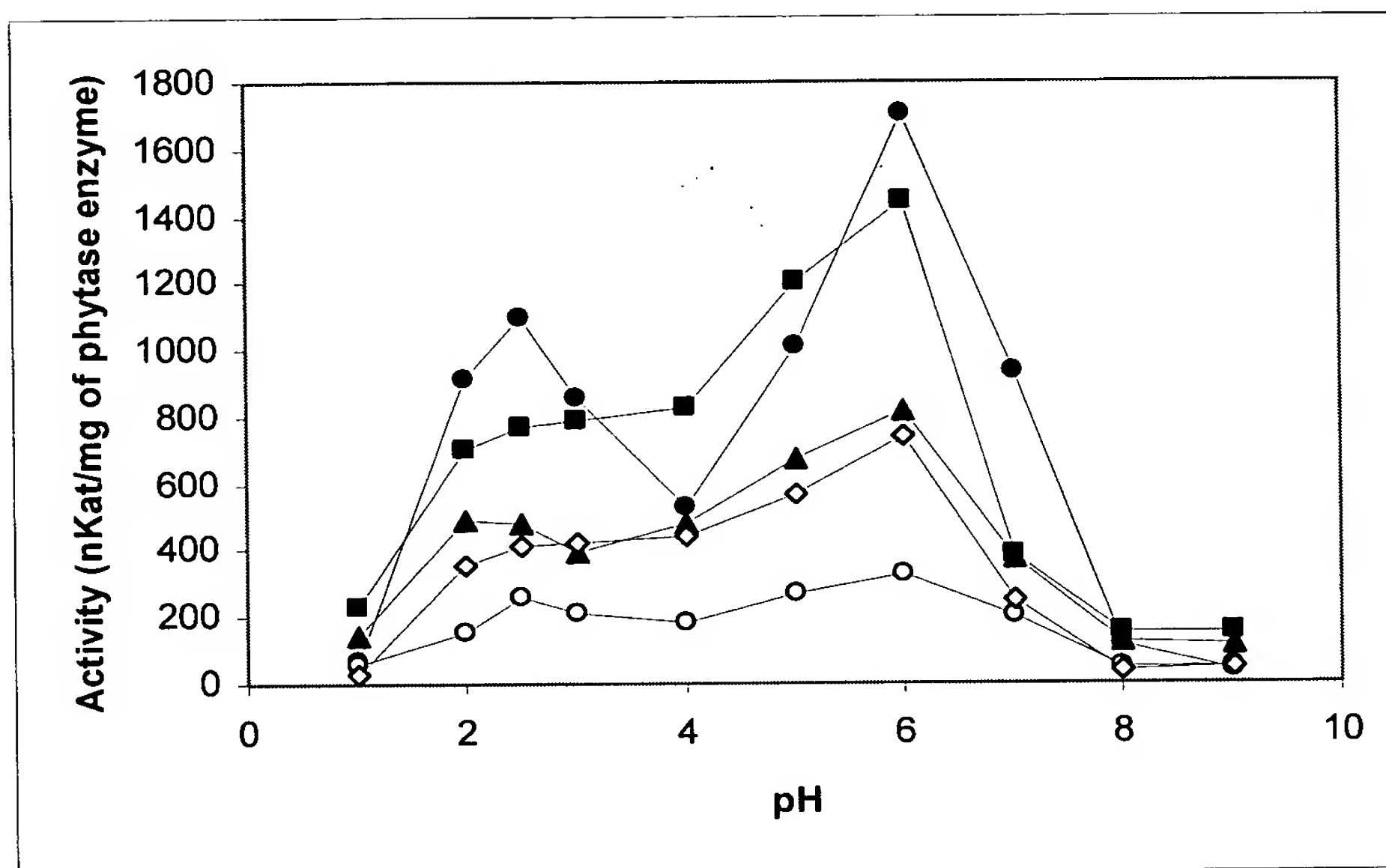


FIG. 6

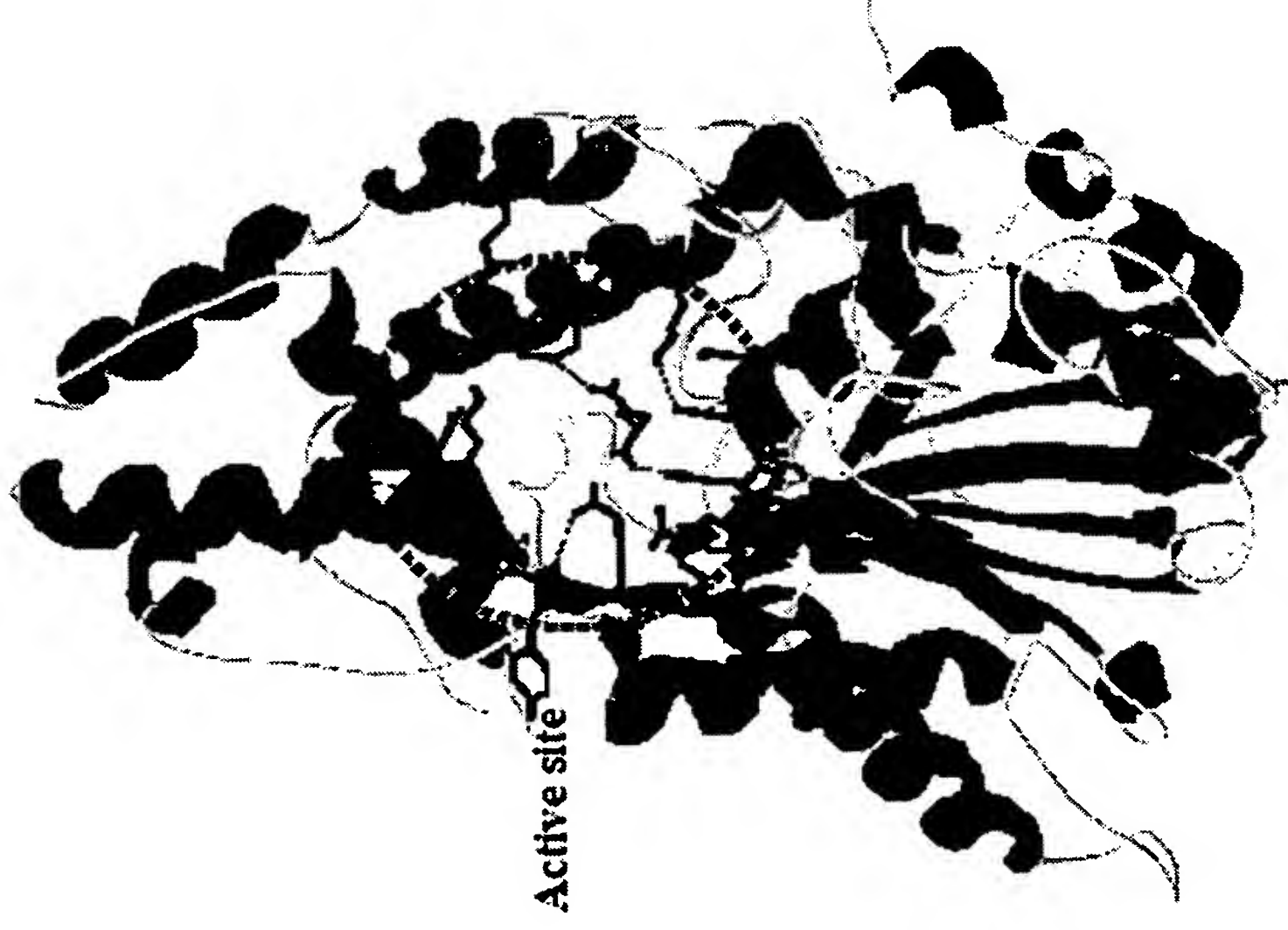


FIG. 7A

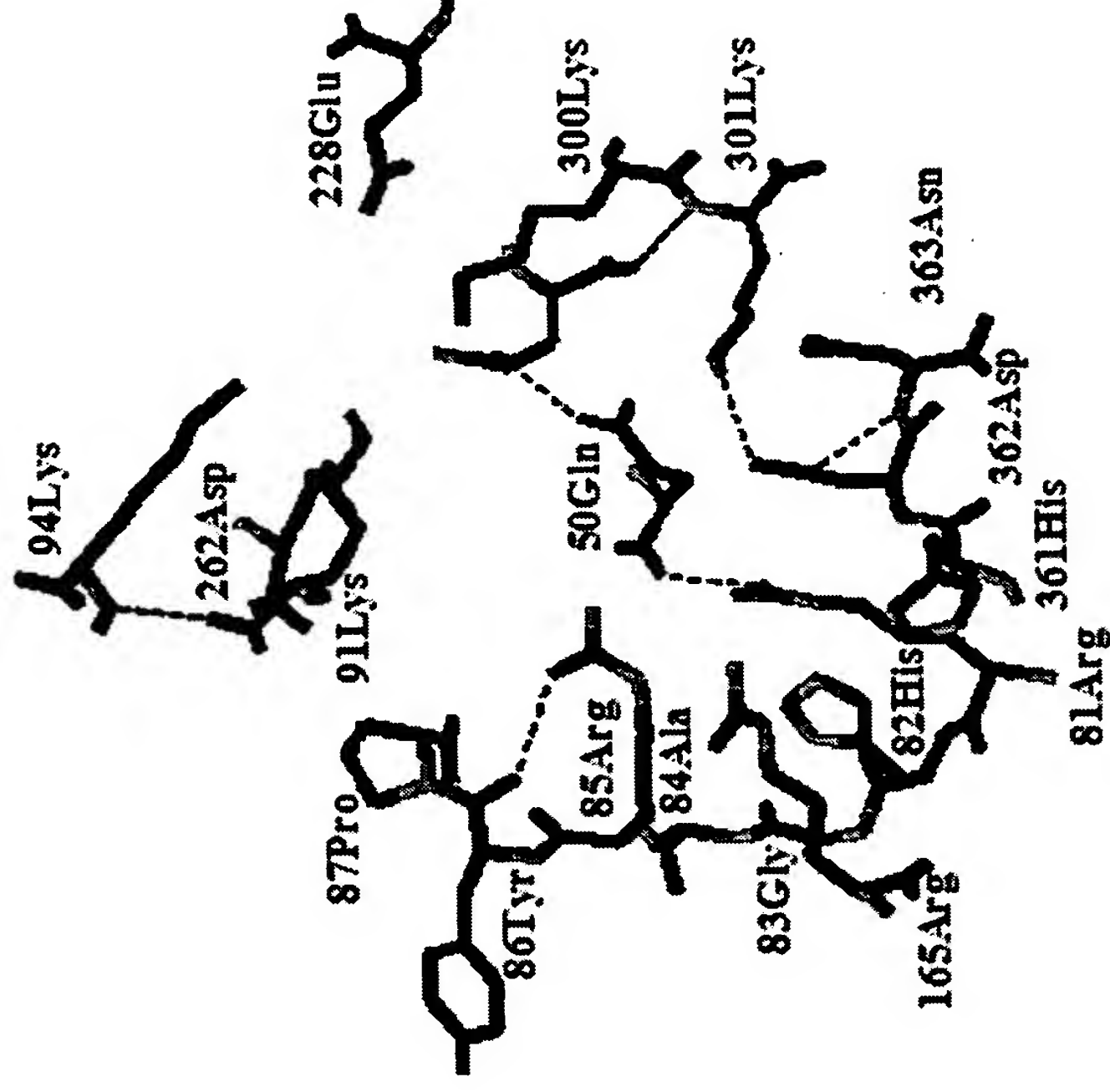


FIG. 7B

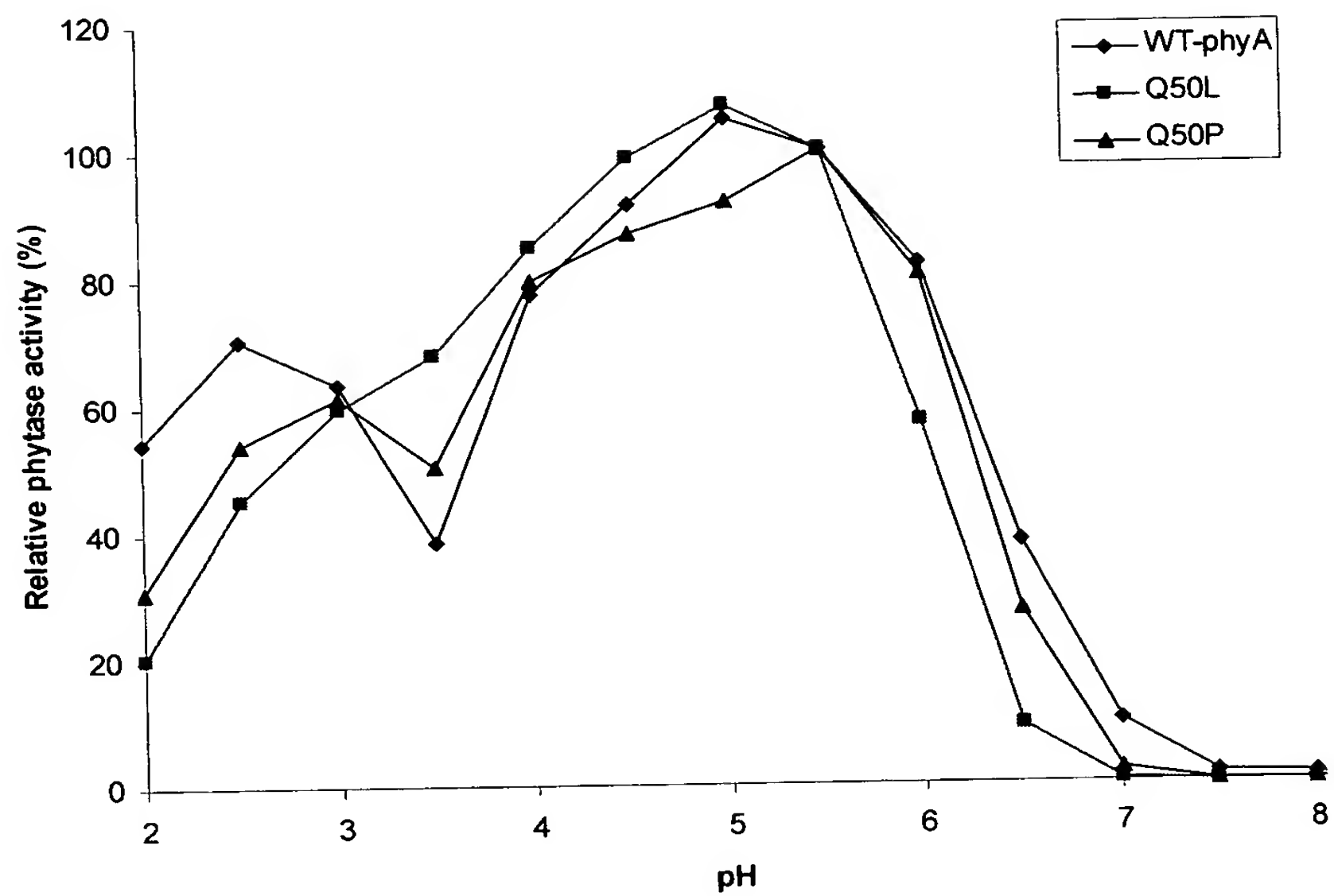


FIG. 8A

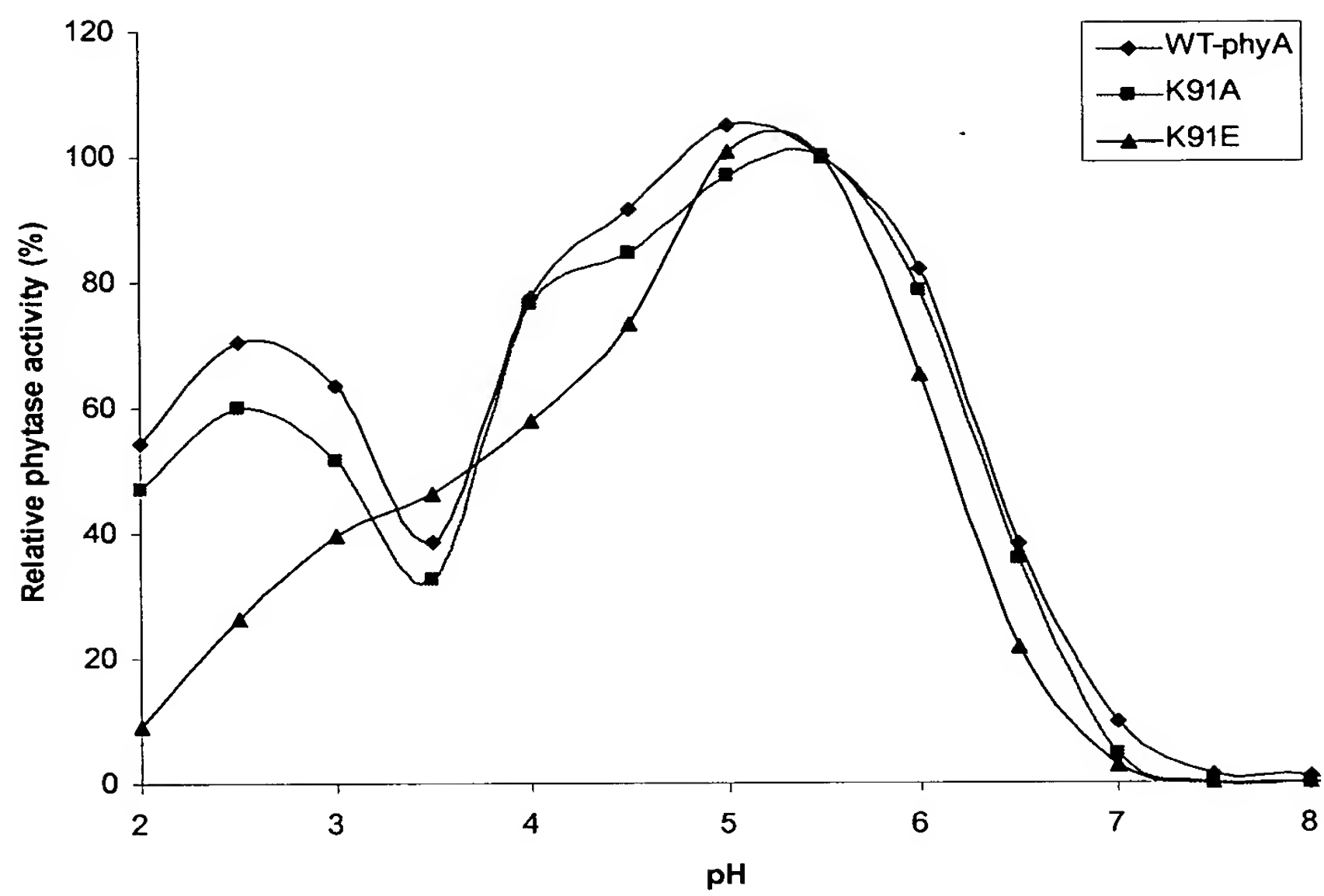


FIG. 8B

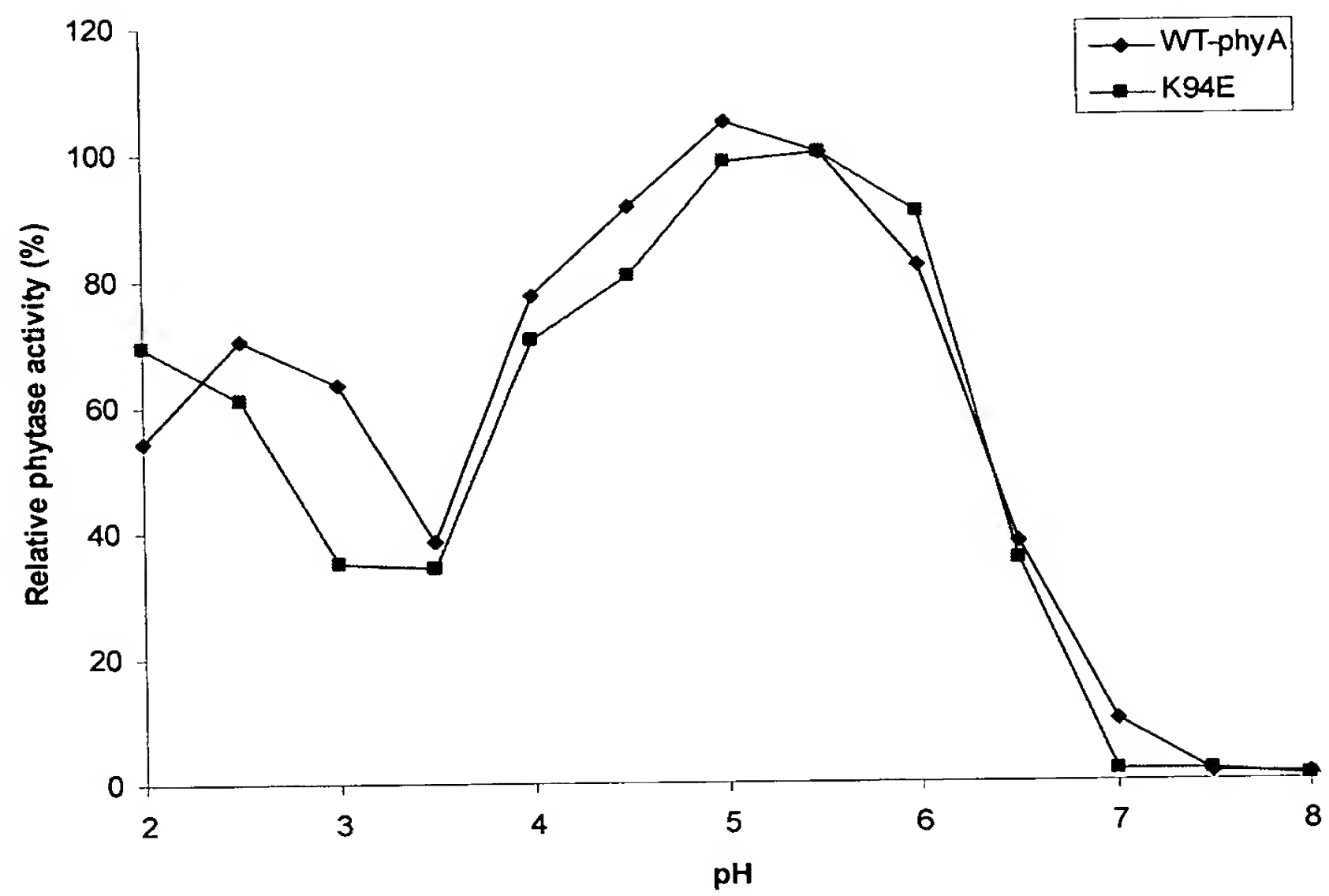


FIG. 8C

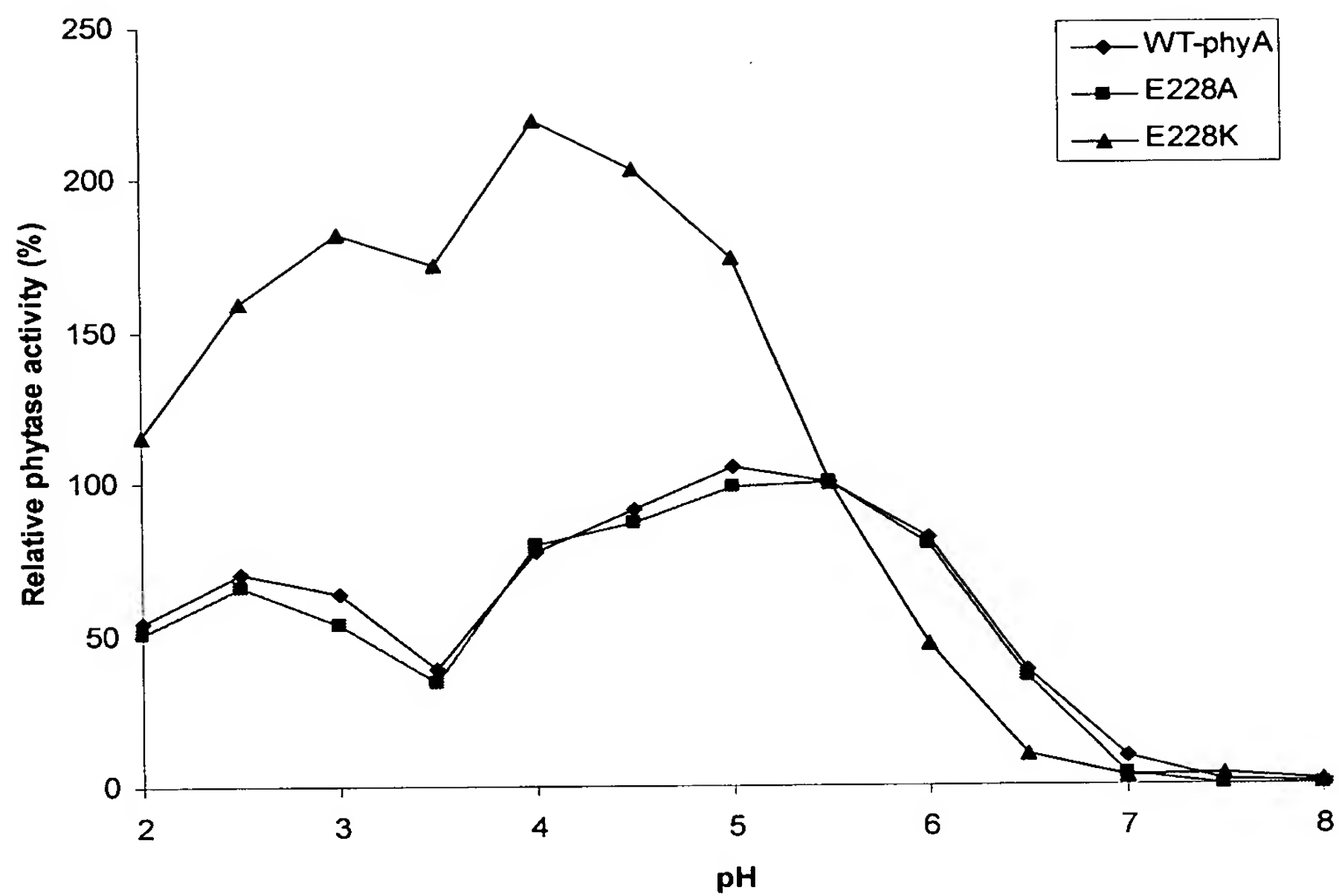


FIG. 8D

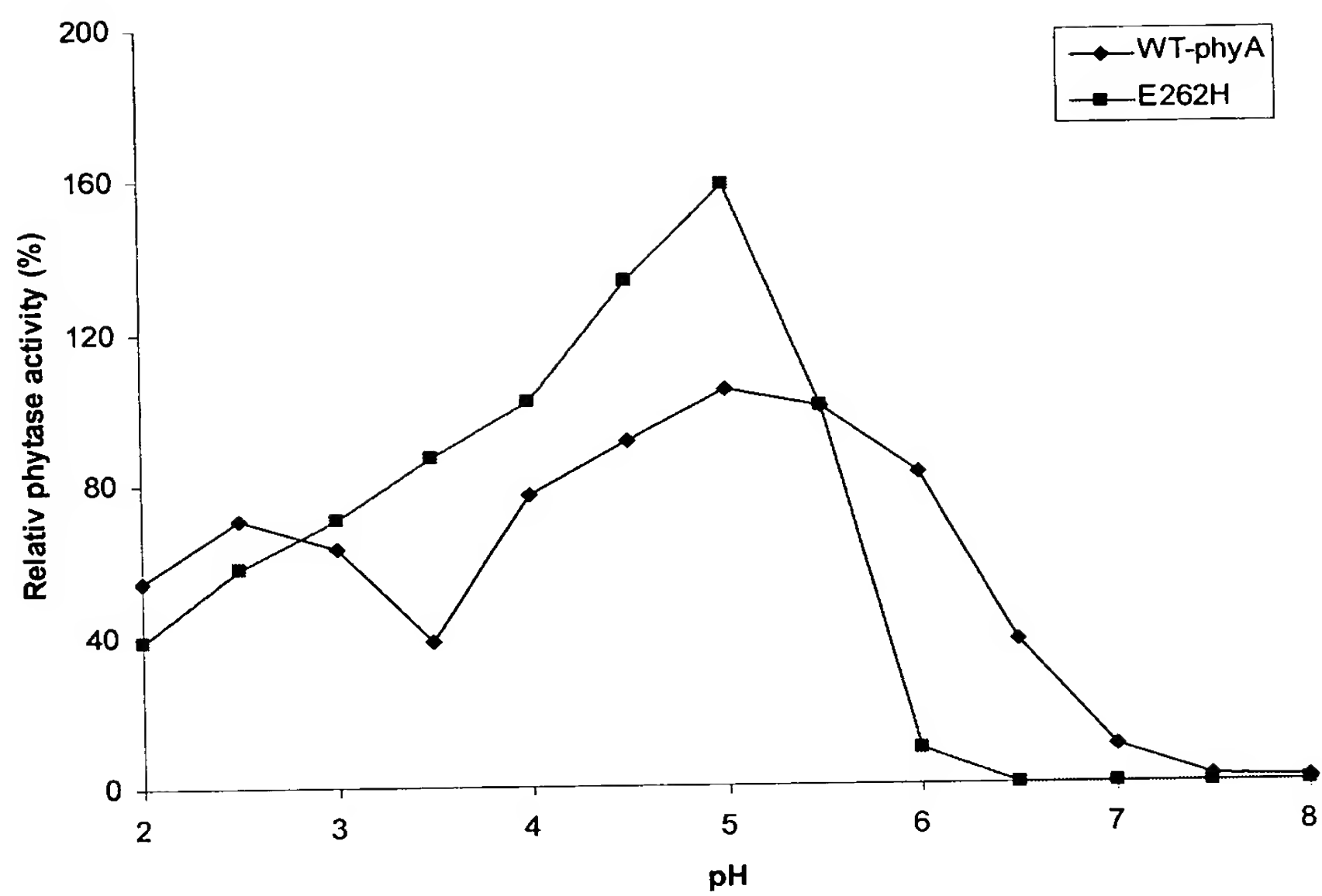


FIG. 8E

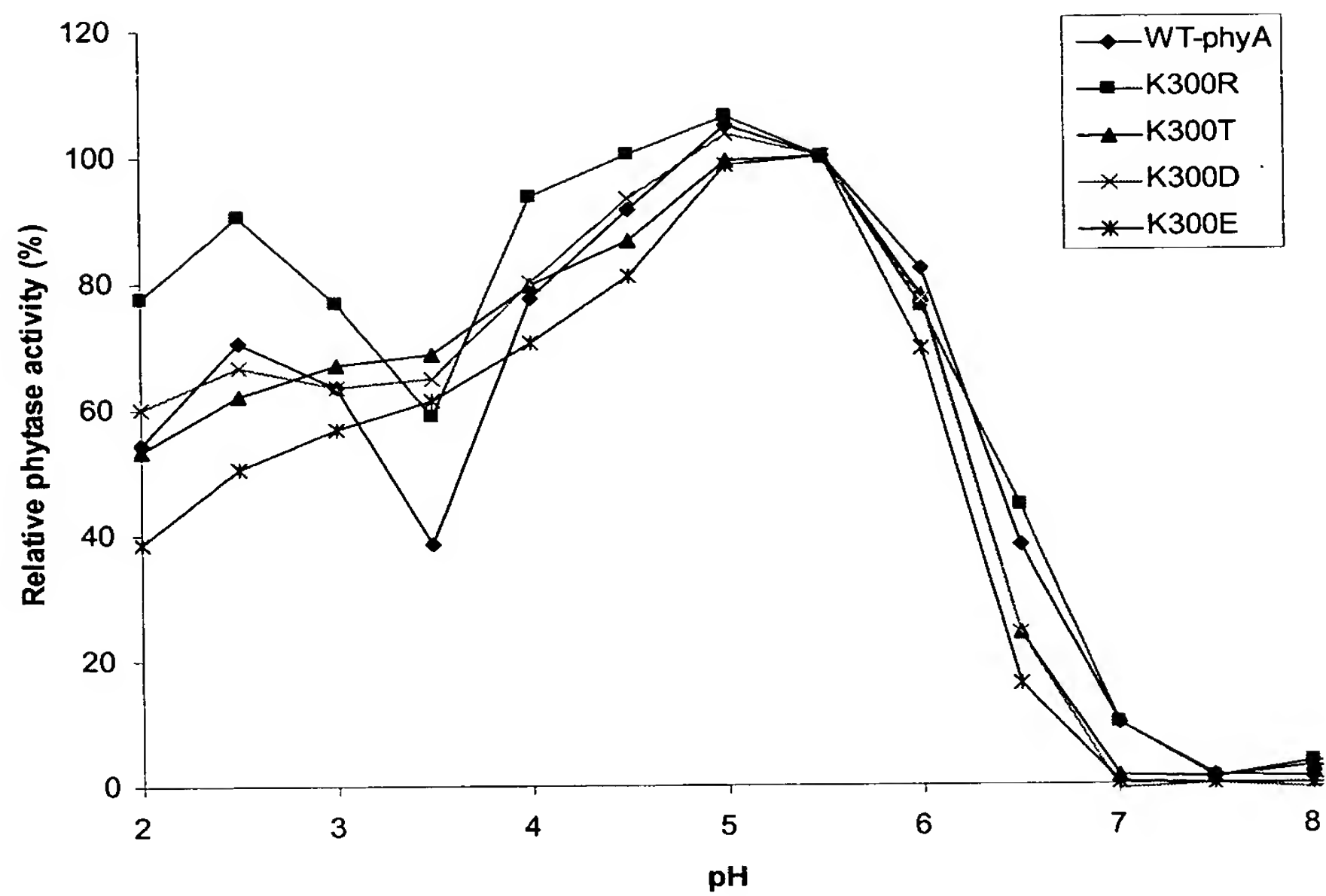


FIG. 8F

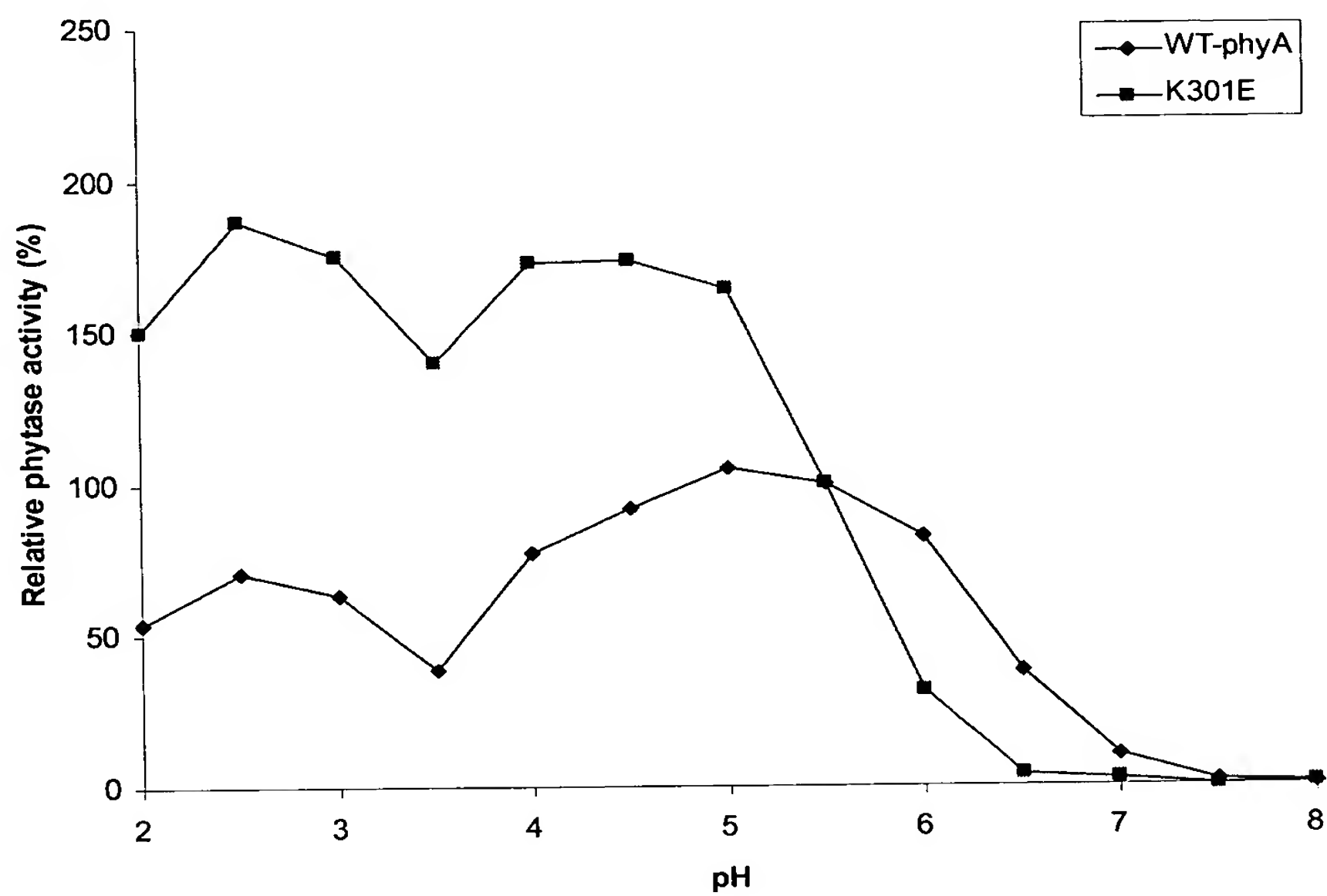


FIG. 8G

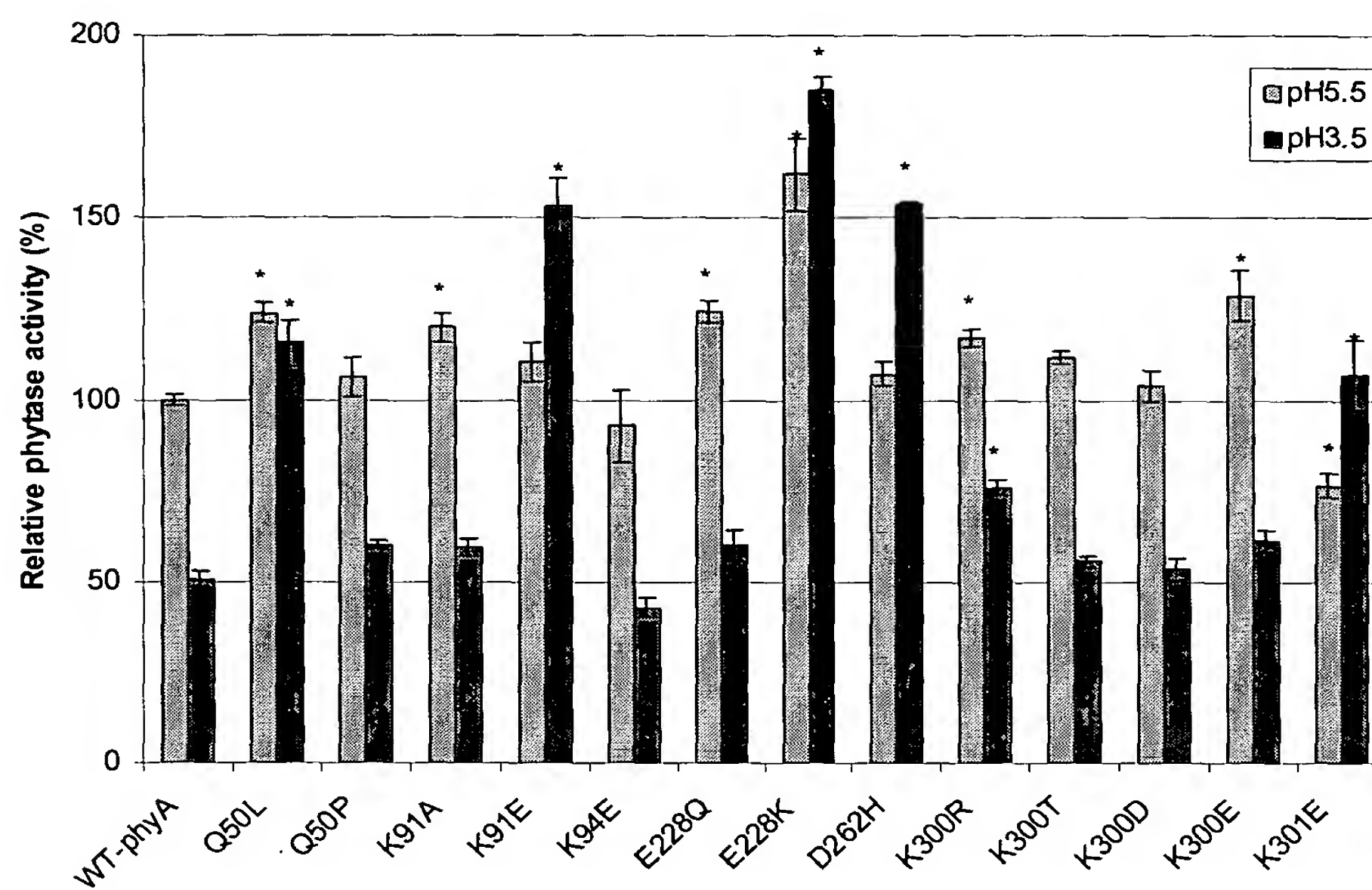


FIG. 9

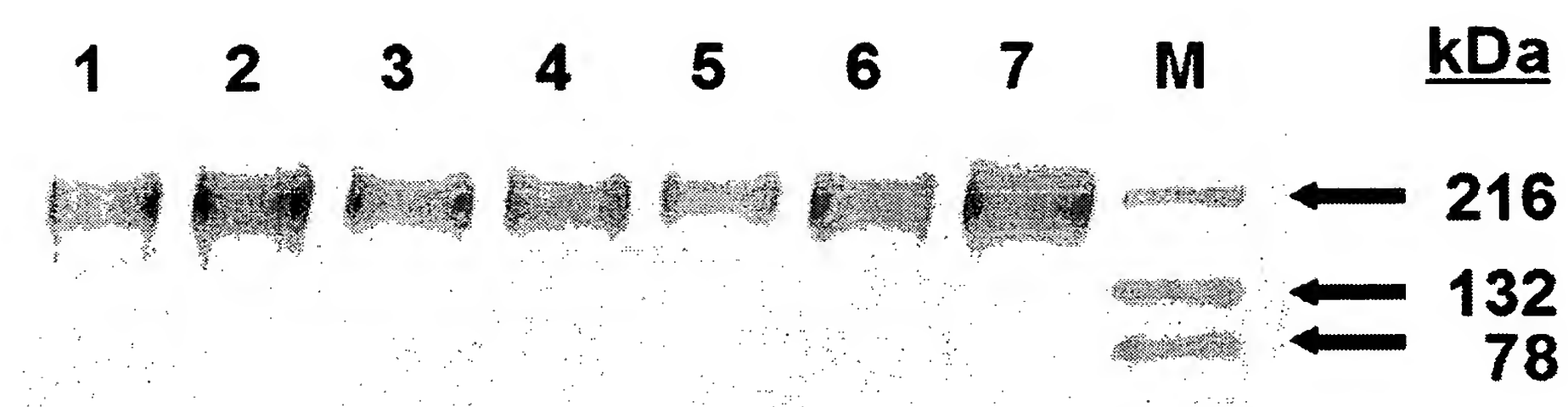


FIG. 10A



FIG. 10B

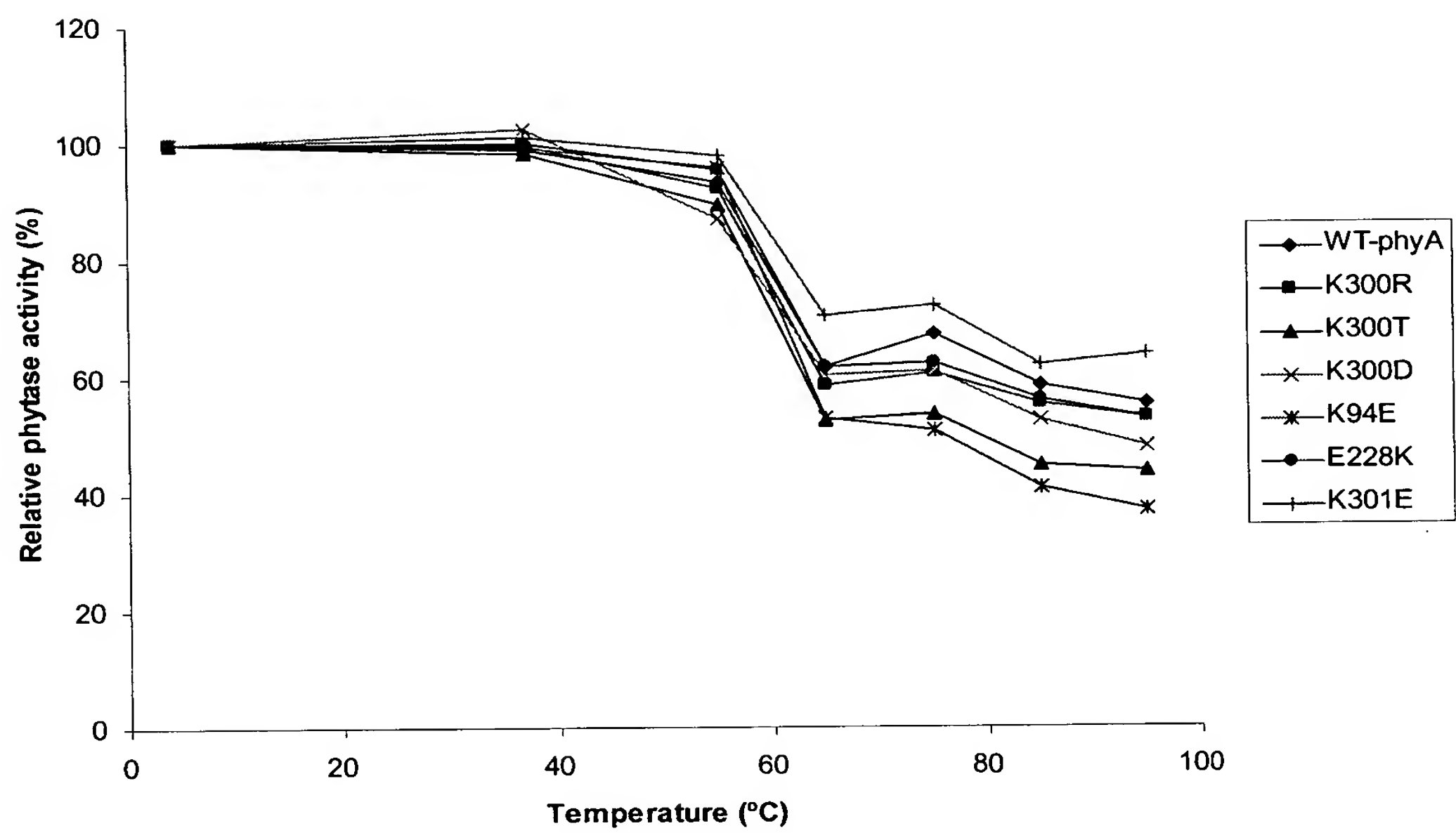


FIG. 11

1st line: Asp. terreus phytase
 2nd line: Asp. niger phytase
 3rd line: Asp. fumigatus phytase

```

1  MGVEFVLLSI  ATLFGSTSGT  ALGPRGNHSD  CTSVDRGYQC  EPELSHKWGL
1  MGVSALLPL  YLLSGVTSGL  AVPASRNQSS  CDTVDOGYQC  FSETSHLWGO
1  MVTLTFLLSA  AYLLSGRVS-  AAPSSAGSKS  CDTVDLGYQC  SPATSHLWGO
****
                                SSS  SSSS

51  YAPYFSLQDE  SPFPLDVDD  CHITEVOVLA  RHGARSPTDS  KTKAYAATIA
51  YAPFFSLANE  SVISPEVPAG  CRVTFQVLS  RHGARYPTDS  KKKYSALIE
50  YSPFFSLEDE  LSVSSKLPKD  CRITLVQVLS  RHGARYPTSS  KSKKYKKLVT
****
    SSS          S  SSSSSSSSSSSSS SSS  HH  HHHHHHHHHH

101  ATQKNATALP  GKYAFLKSYN  YSMGSENINP  FGRNQLQDLG  AOFYRRYDTL
101  EIQONATTED  GKYAFLKTYN  YSLGADDLTP  FGEQELVNNG  IKFYORYESI
100  AIQANATDEK  GKFAFLKTYN  YTLGADDLTP  FGEQQLVNNG  IKFYORYKAI
****
HHHHH          HHHH          SSSH  HHHHHHHHHH  HHHHH  HH

151  TRHINPEVRA  ADSSRVHESA  EKEVEGEFQA  RQGDPHANPH  QPSPRVDVVI
151  TRNIVPFIRS  SGSSRVIASG  KKFIEGFQST  KLKDERAQPQ  QSSPKTDVVI
150  ARSVVPFIRA  SGSDRVIASG  EKFIEGFQQA  KLADPGA-TN  RAAPATSMII
****
H          SSSS  SS  HHHHHHHH  HHHHHHHHHH  HH          SSS

201  PEGTAYNNTL  EHSICTAFEA  STVGDAADN  FTAVEAPATA  KRLEADLPV
201  SEASSNNTL  DPGTCTVFED  SELADTVEAN  FTATEVESIR  QRLNDLSGV
199  PESETFNNTL  DHGVCTKEEA  SOLGDEVAAN  FTALAEADIR  ARAEKHLPGV
****
                                HHHH  HHHH  HHHH  HHHH

251  QLSADDVNL  MAMCPFEETVS  LTDDAHTLSP  FCDLFTAAEW  TOYNYLLSLD
251  TLTDTEVTYL  MDMCSFDTIS  TSTVDTKLSP  FCDLFTHDEW  INYDYLOSLK
249  TLTDDEVVSL  MDMCSFDTVA  RTSDASQLSP  FCDLFTHNEW  KKYNLYLOSLG
****
    HHHHHH  HHHHHH  HHH  HHHH  HHHHHHHHHH

301  KYYGYGGNP  LGPVQGVGWA  NELIARLTRS  PVHDHTCVNN  TLDANPATFP
301  KYYGHGAGNP  LGPTQGVGYA  NELIARLTHS  PVHDDTSSNH  TLDSSPATFP
299  KYYGYGAGNP  LGPAOGIGFT  NELIARLTRS  PVQDHTSTNS  TLVSNPATFP
****
H          HH  HHH  HHHHHHHH          H  HHH

351  LNATLYADES  HDSNLVSIWF  ALGLYNGTKP  LSQTTVEDIT  RTDGYAAAWT
351  LNSTLYADFS  HDNGIISLIF  ALGLYNGTKP  LSTTTVENIT  QTDGFSSAWT
349  LNATMYVDFS  HDNSMVSIFF  ALGLYNGTEP  LSRTSVESAK  ELDGYSASW
****
    SSSSSSS  HHHHHHHHH  H          HHHH

401  VPFAARAYIE  MMOCRAEKQP  LVRVLVNDRV  MPLHGCAVDN  LGRCKRDDFV
401  VPFAARLYVE  MMOCQAEQEP  LVRVLVNDRV  VPLHGCPVDA  LGRCTRDSFV
399  VPEGARAYFE  TMOCKSEKEP  LVRALINDRV  VPLHGCDVDK  LGRCKLNDFV
****
    SSSSSSS  SSSSS  S  SSSSSSS  SS  S          SSSHHHH

451  EGLSFARAGG  NWAECE-
451  RGLSFARSGG  DWAECEFA
449  KGLSWARSGG  NWGECFS
****
H          HHH          HHGTT

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*Red letter shows the mutation site for substrate binding site.
 *Bold letters are known as critical catalytic active sites.

FIG. 12

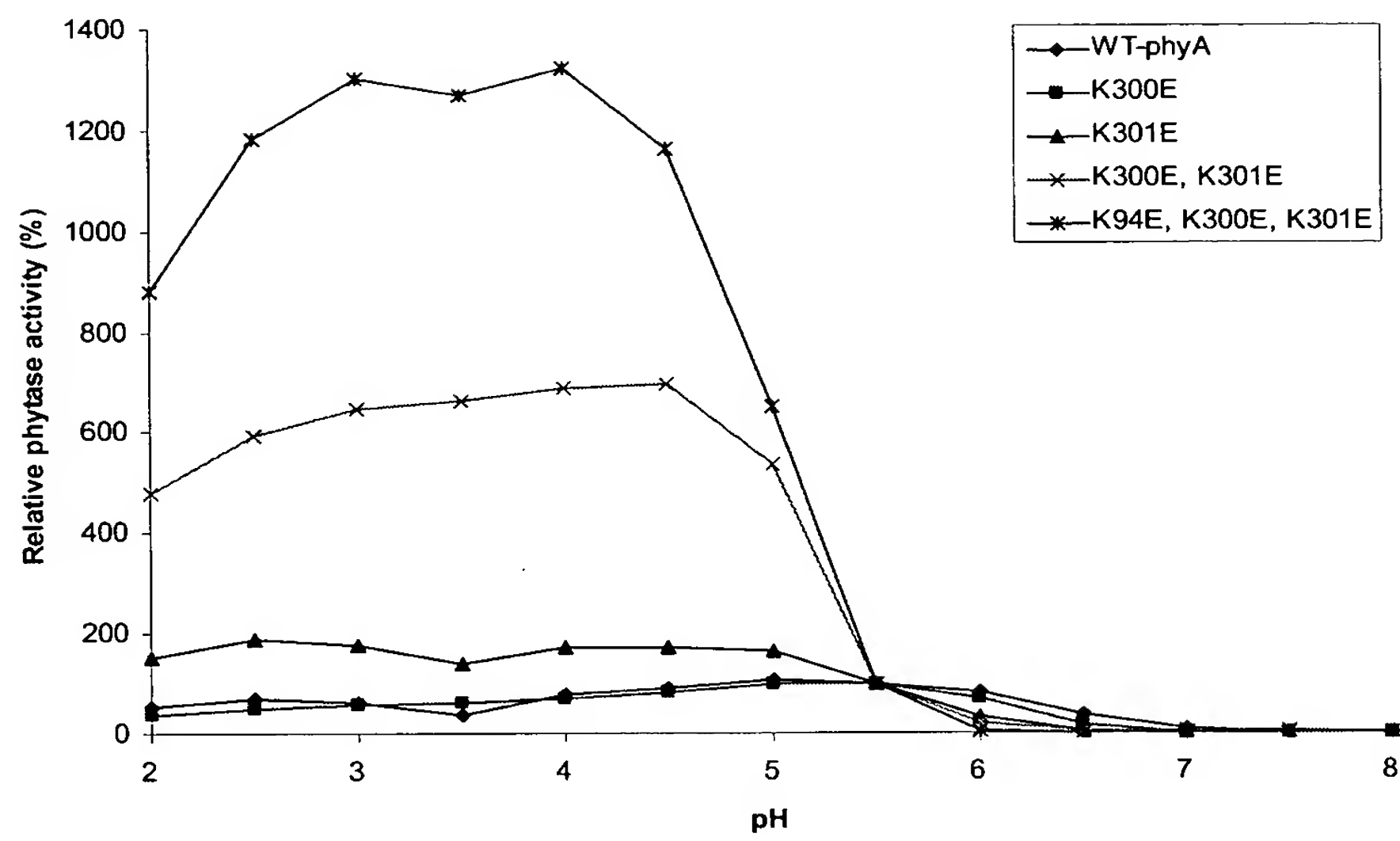


FIG. 13A

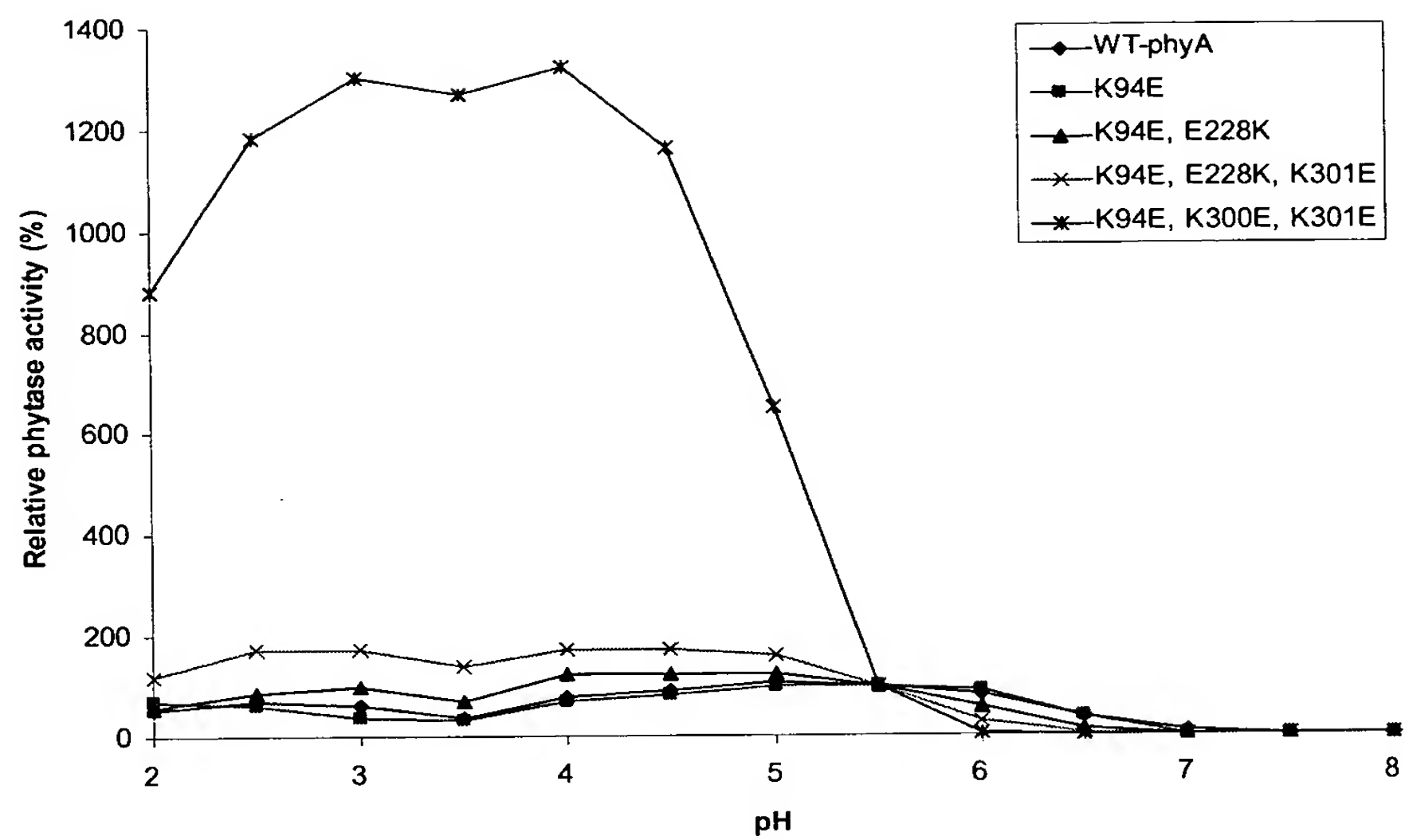


FIG. 13B

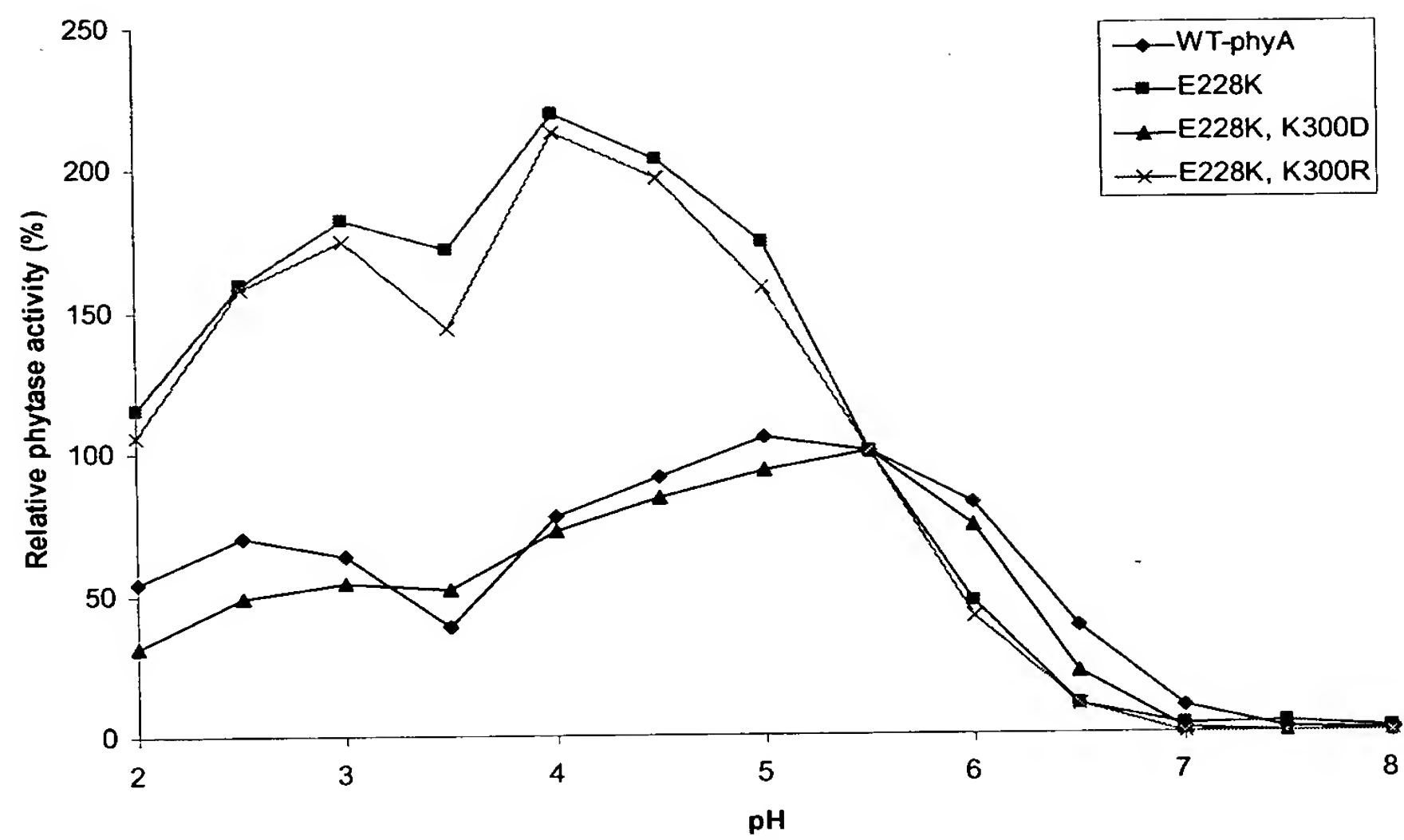


FIG. 13C

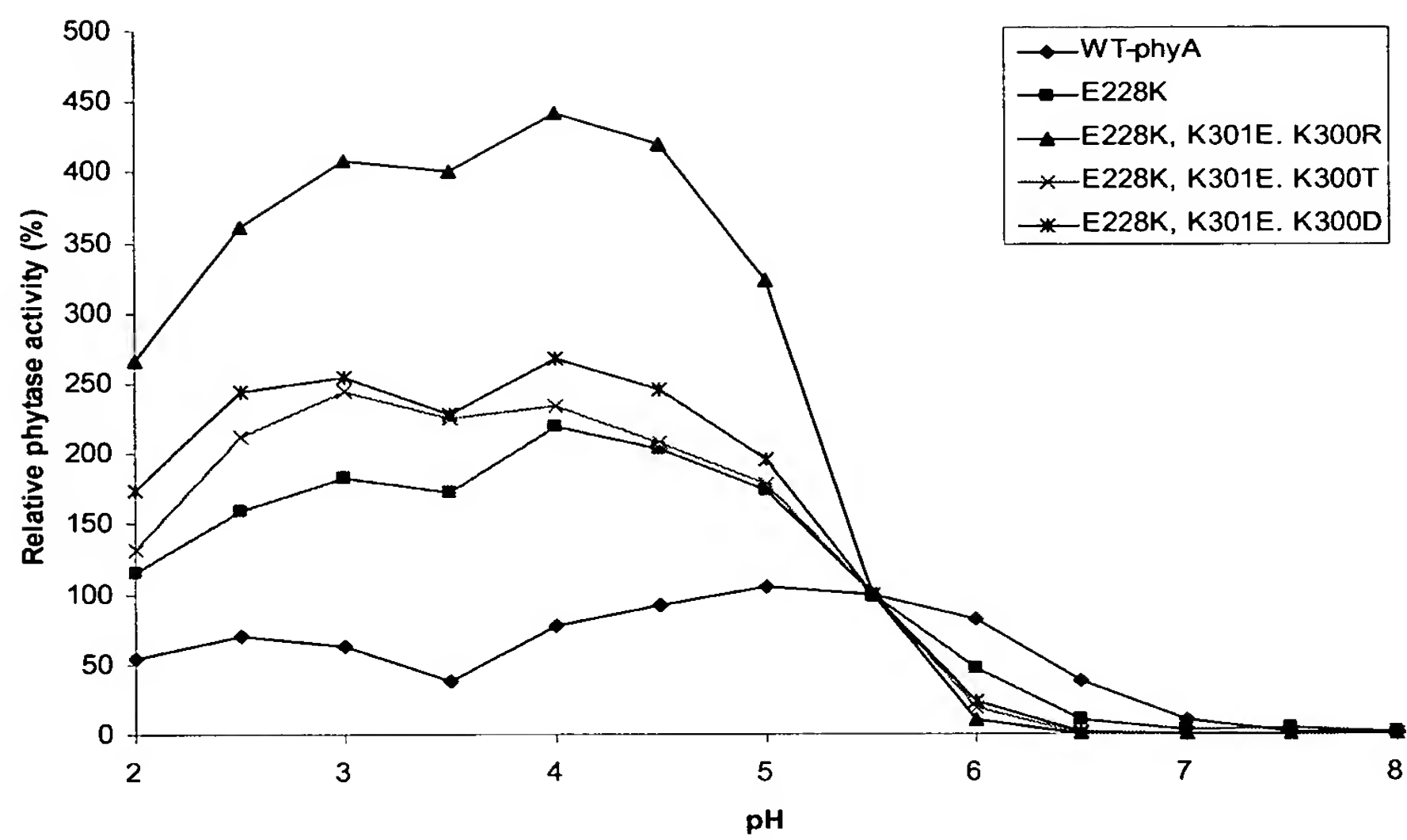


FIG. 13D

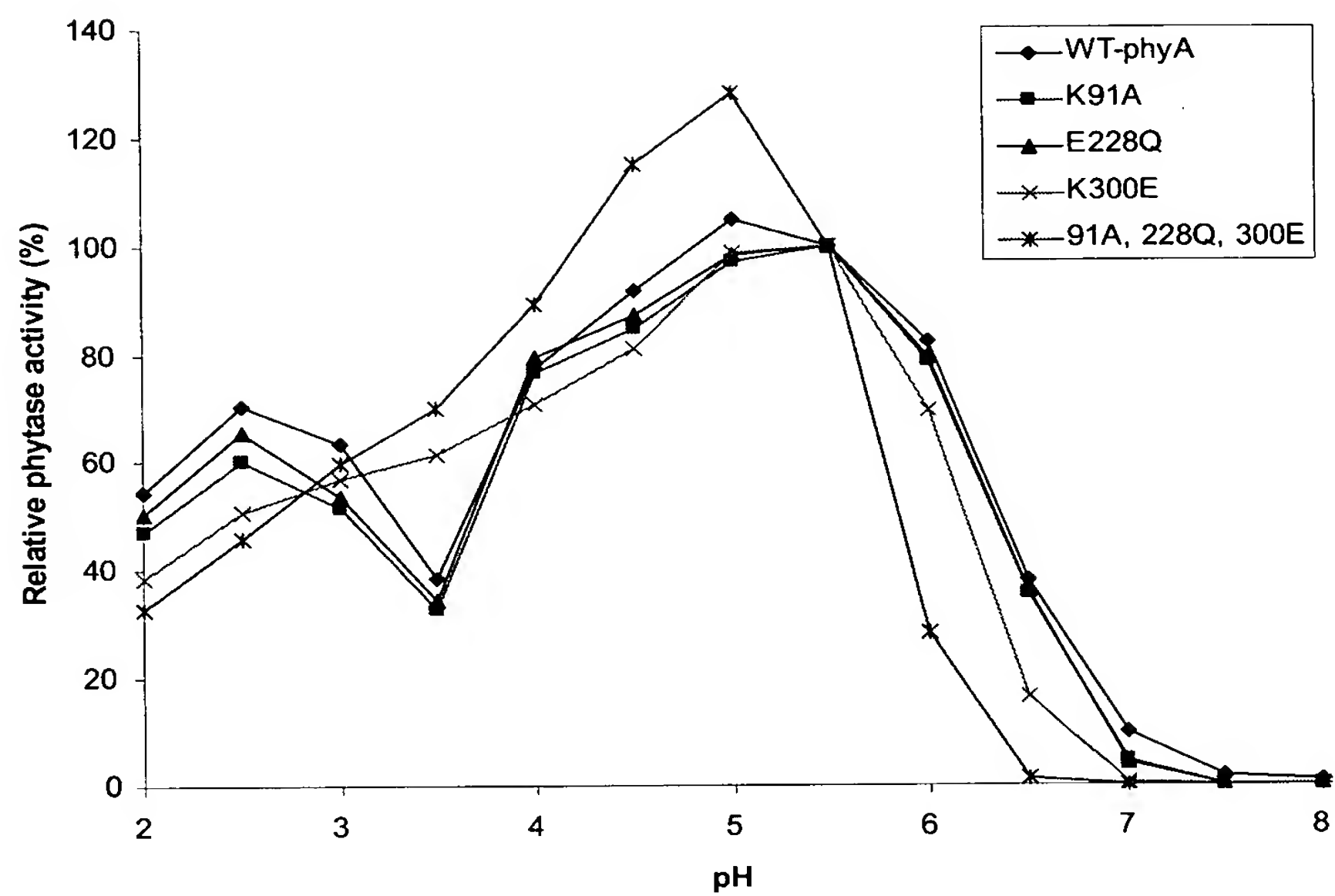


FIG. 13E

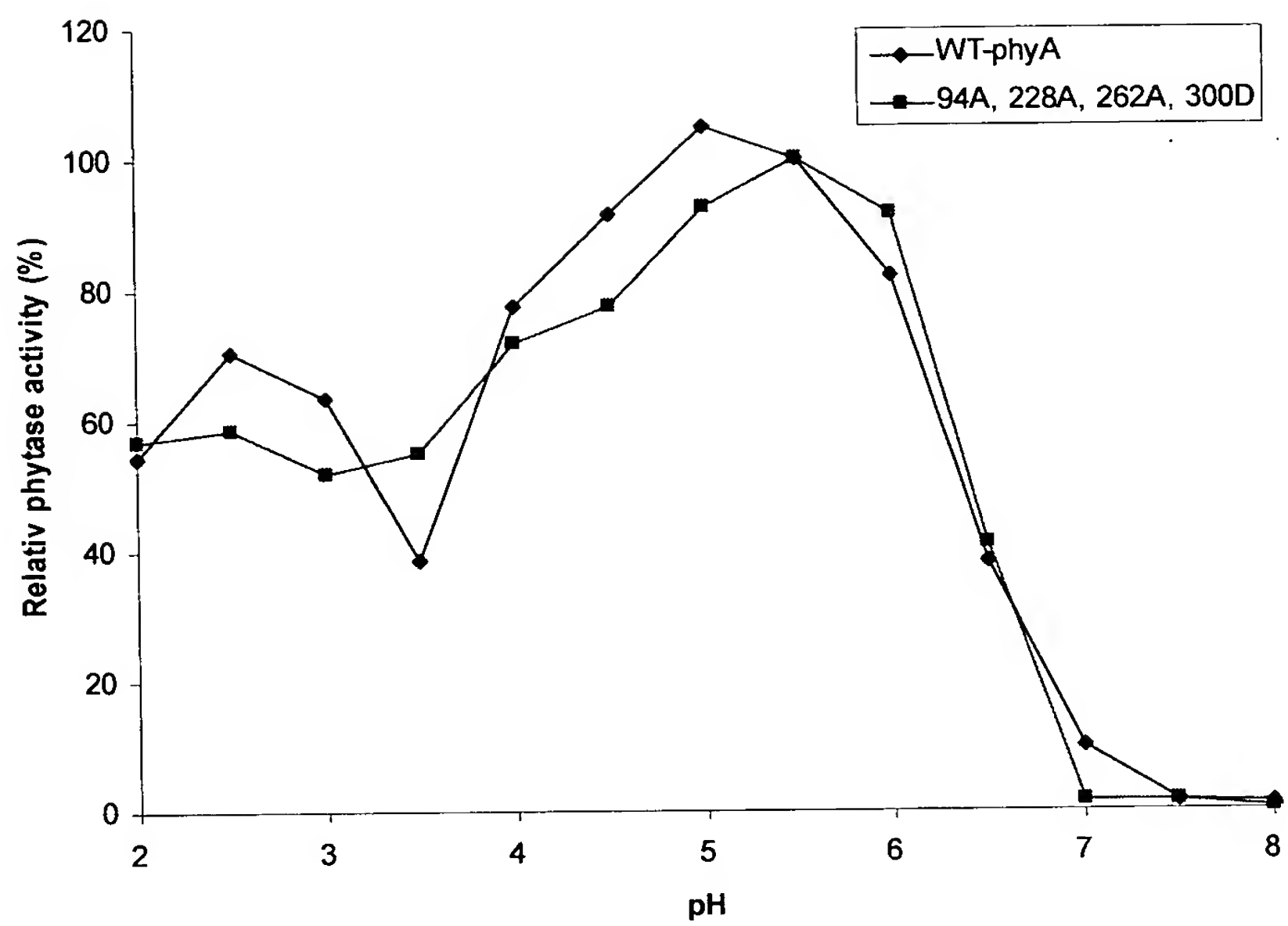


FIG. 13F

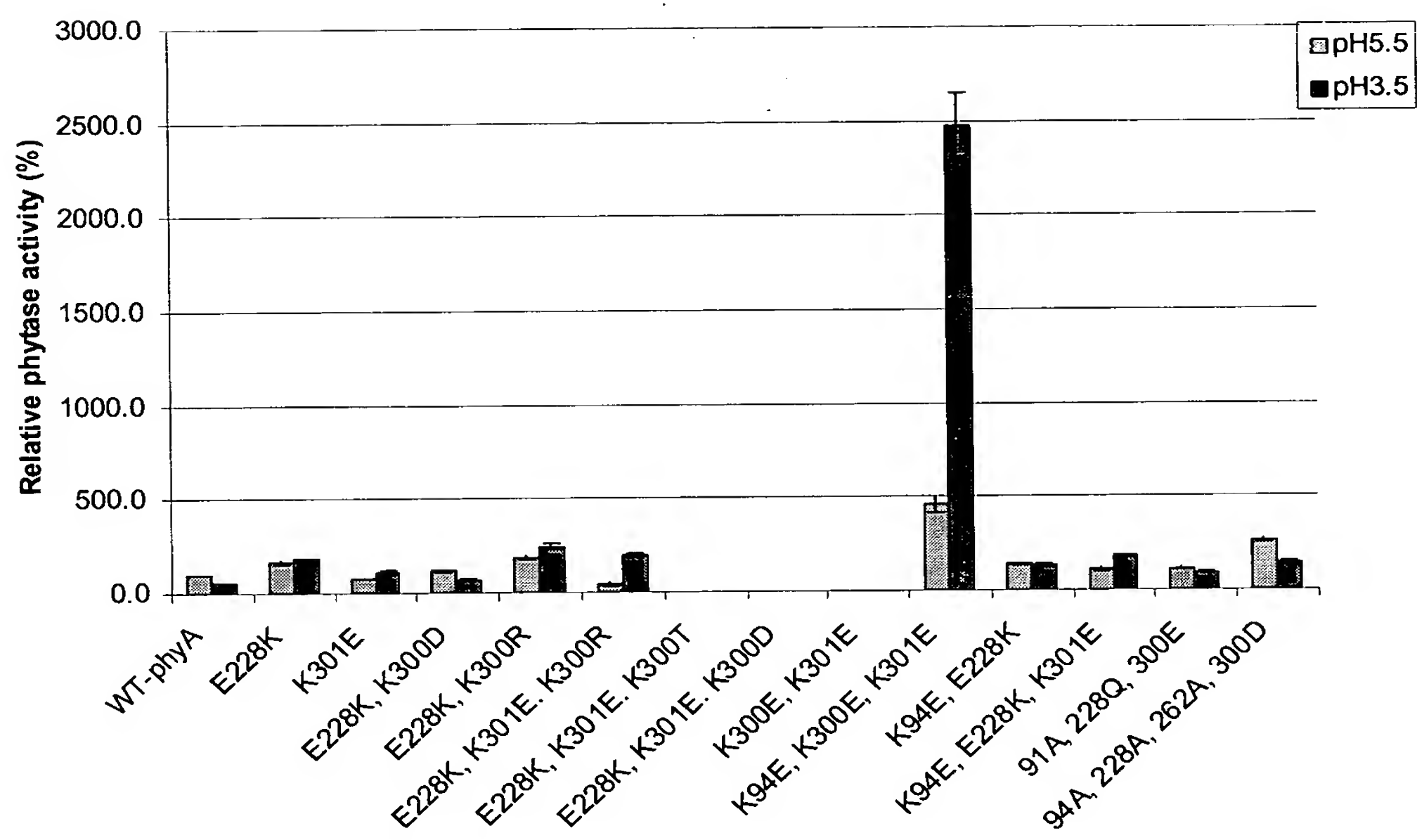


FIG. 14A

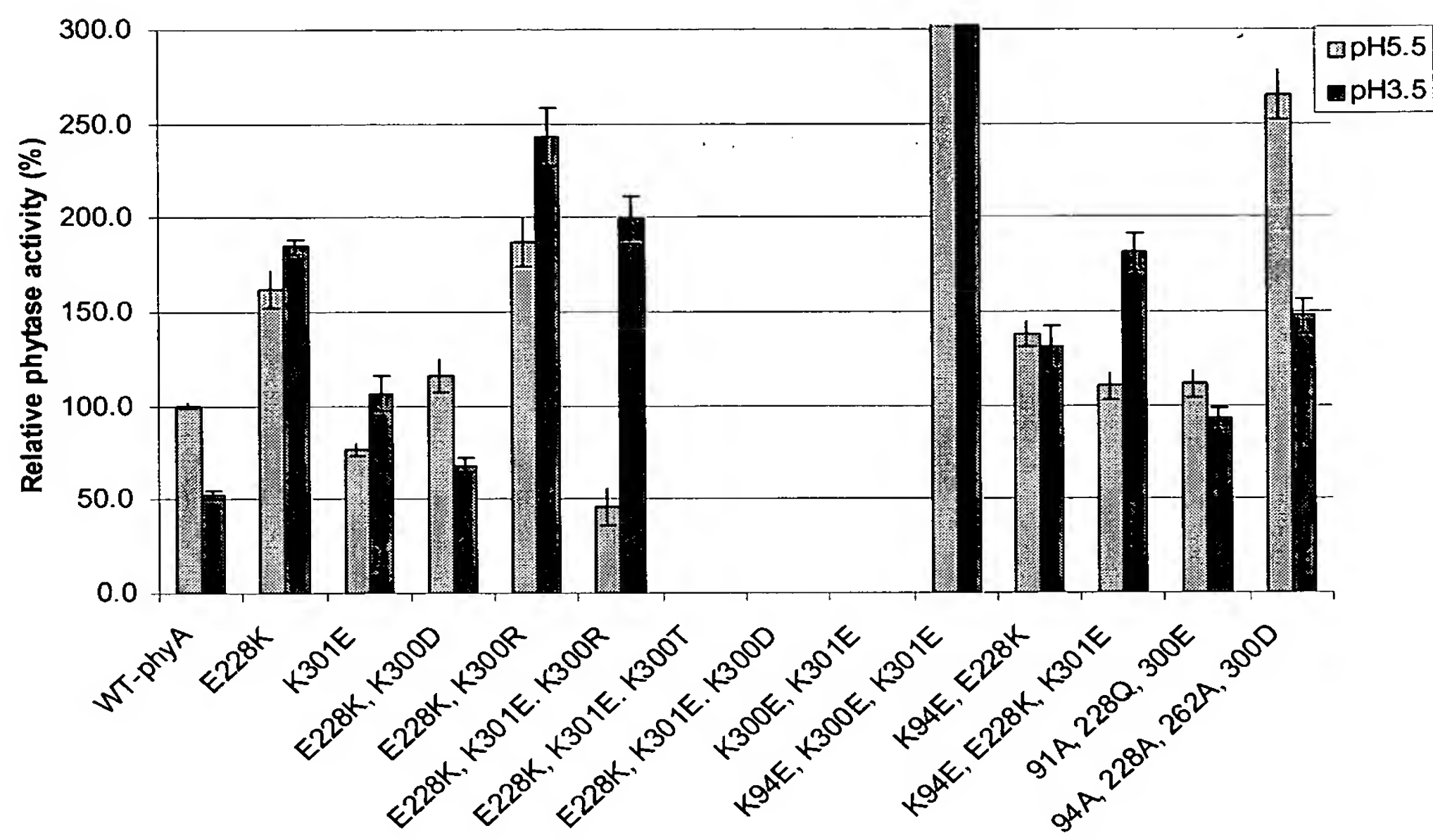


FIG. 14B

Plasma Inorganic Phosphate (PIP) of Pigs Fed Low-P Diets

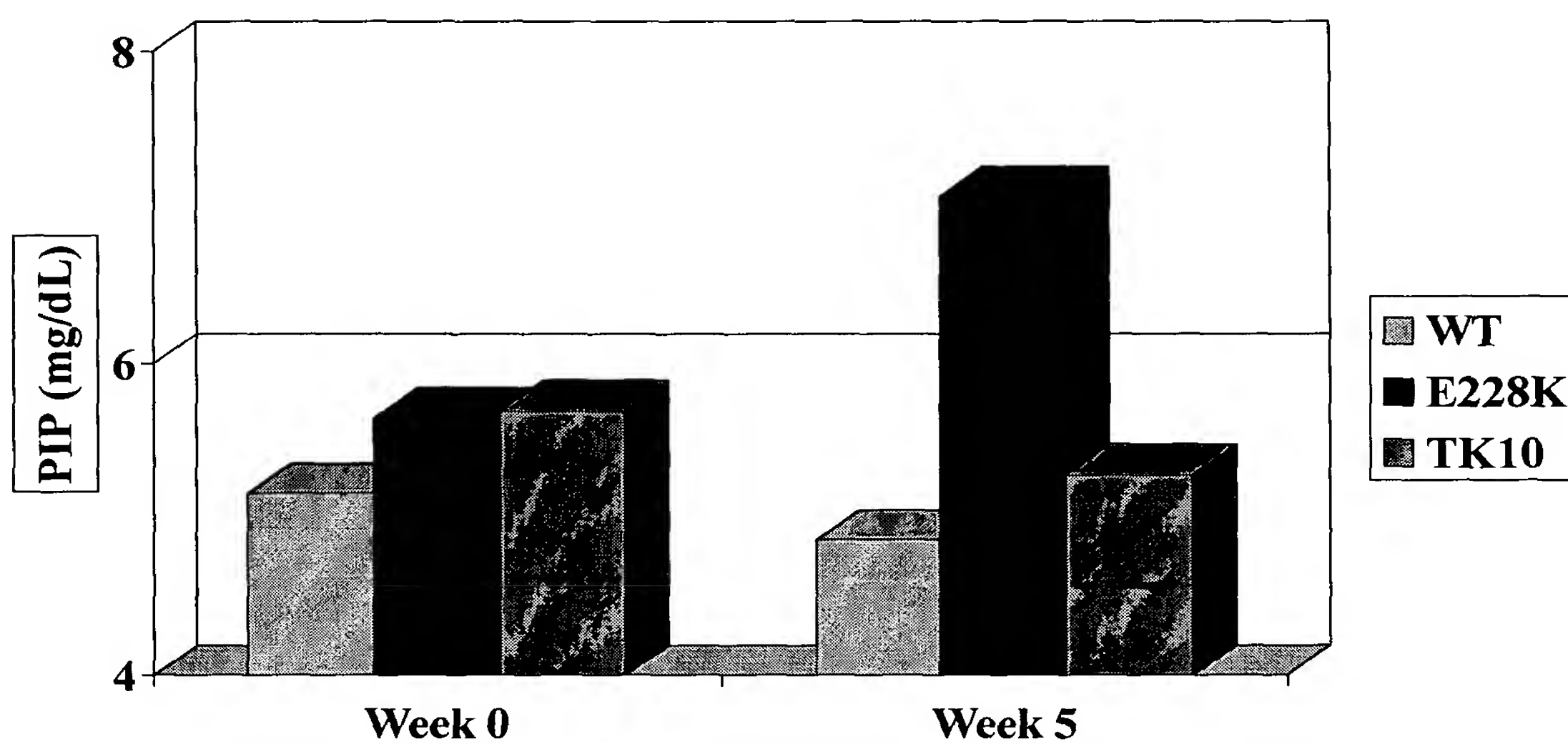


FIG. 15

Plasma Alkaline Phosphatase (AKP) Activity of Pigs Fed Low-P Diets

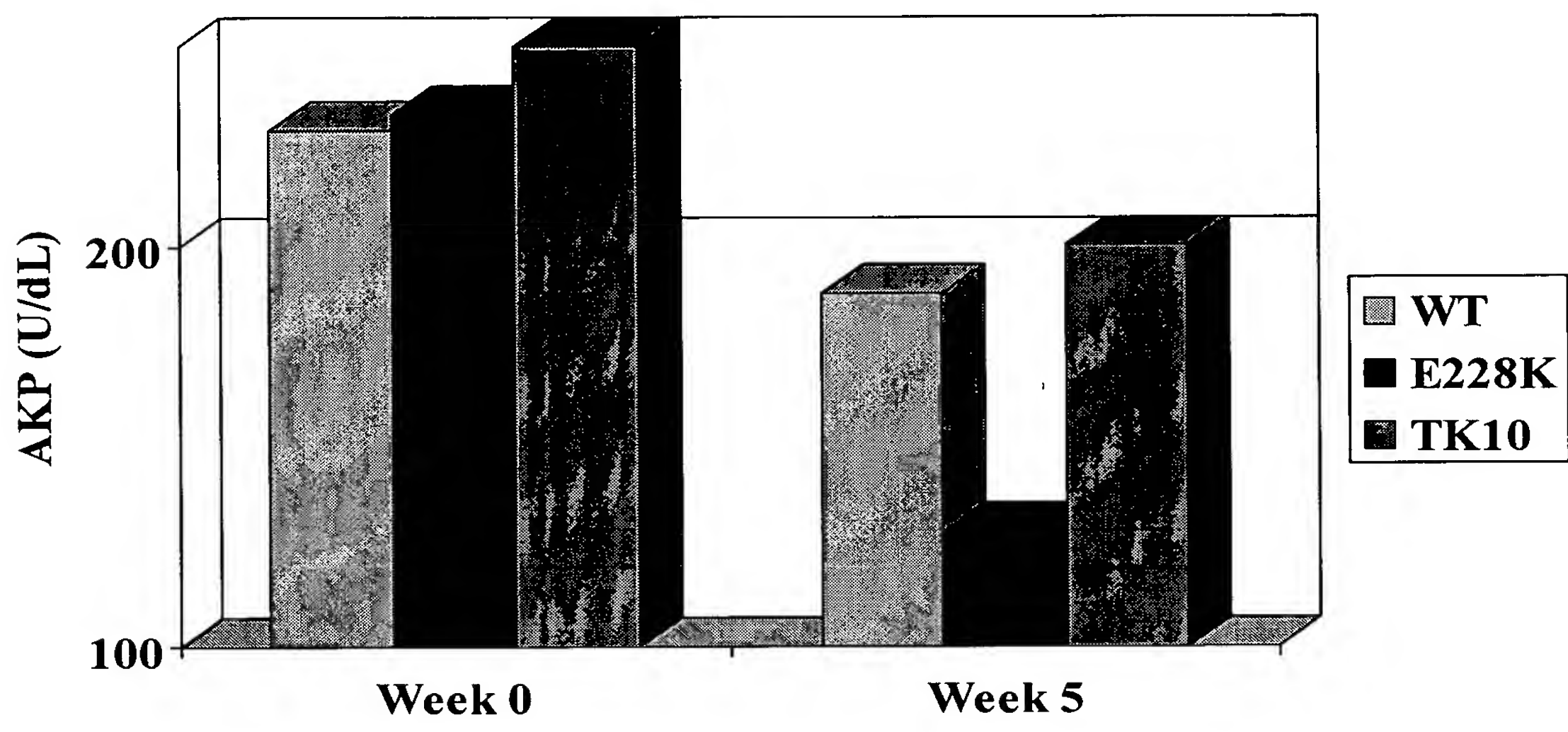


FIG. 16

Average Daily Gain (ADG) of Pigs Fed Low-P Diets

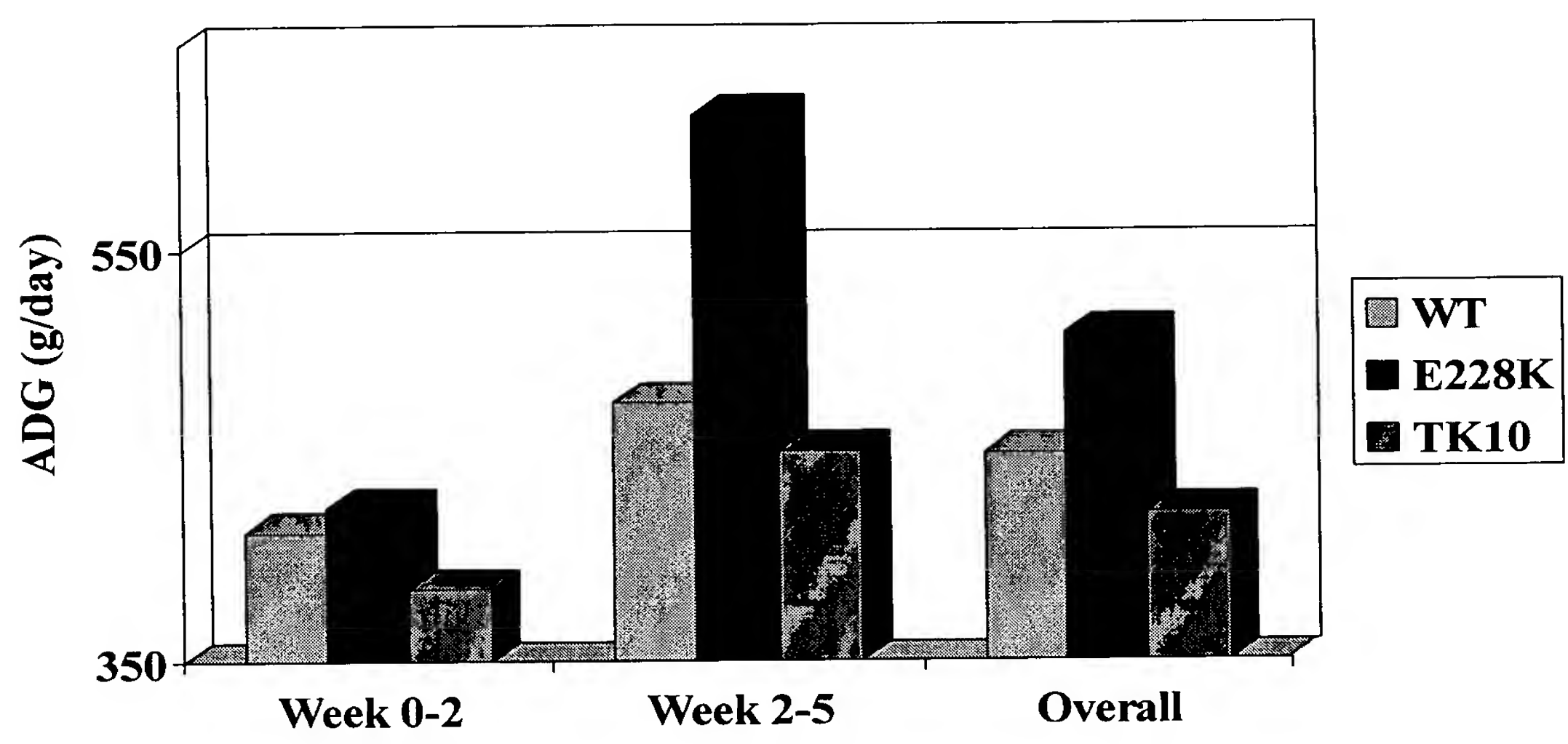


FIG. 17

Gain/Feed of Pigs Fed Low-P Diets

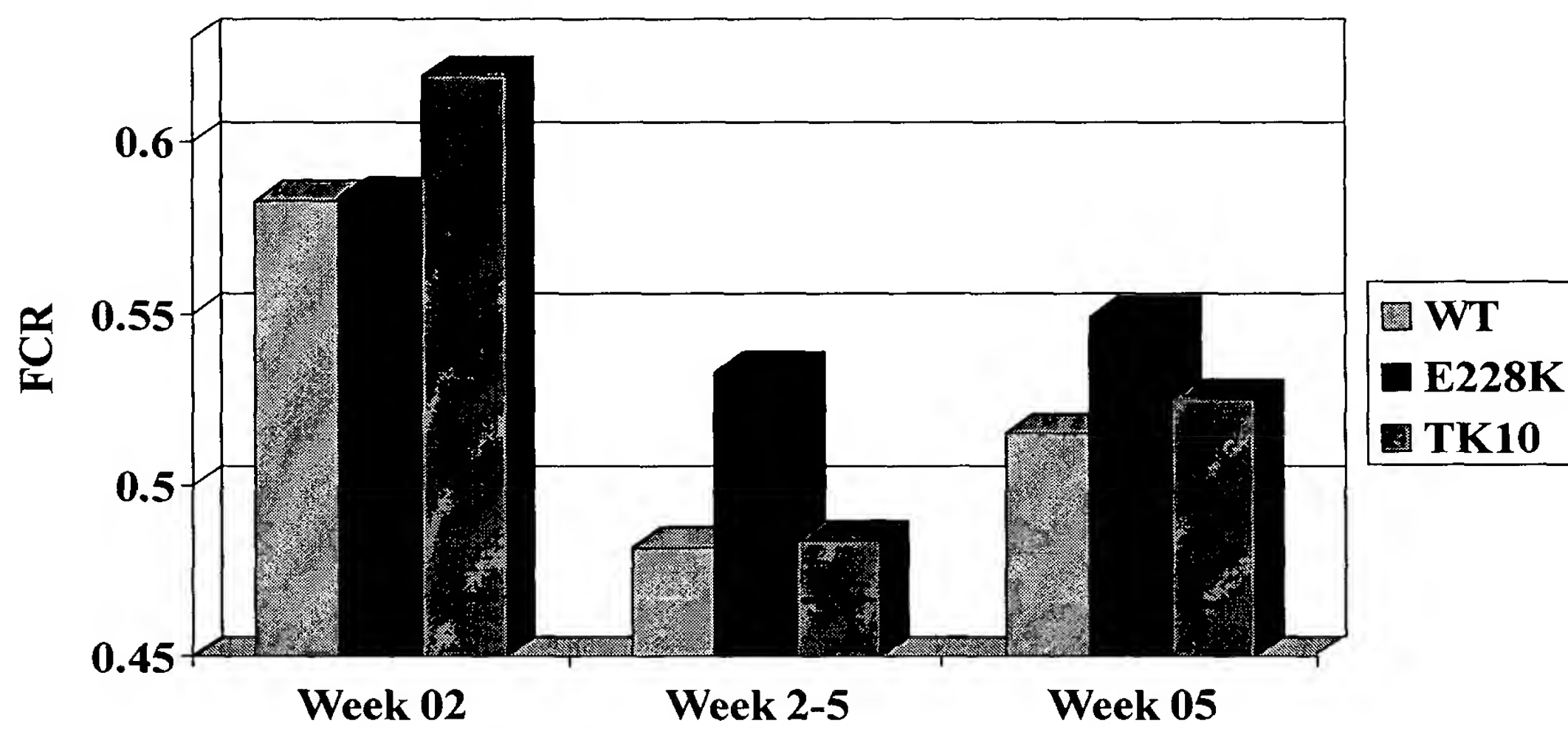


FIG. 18